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Understanding The Relationship Of Contextual Support, Peer Risk Trajectories, And School Outcomes For At-Risk Youth

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UNDERSTANDING THE RELATIONSHIP OF CONTEXTUAL SUPPORT, PEER RISK
TRAJECTORIES, AND SCHOOL OUTCOMES FOR AT-RISK YOUTH

by

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DEDICATION

I dedicate my dissertation to my amazing family and wonderful friends. I am forever grateful to Mom, Dad, Will, Ethan, and Mimmie for their unconditional love, support, encouragement, and understanding over the past six years, as I've directed so much of my focus to my doctoral milestones. I also dedicate my dissertation to my writing crew: Michelle Abraczinskas, Allison Stafford, Emma Kate Wright, Rebeca Castellanos, Alycia Roberts, and many others. Without our coffee shop writing dates and weekend write-a-thons, I do not think I would have made progress as quickly as I did. In addition to the above, I am grateful to my classmates: Hannah Reckart, Marissa Miller, Kristin Otis, and Heather McDaniel for their incredible support and unwavering encouragement throughout our training. Finally, I dedicate my dissertation to the formal and informal mentors I have had throughout my undergraduate and graduate career: Drs. Mark Weist, Nicole Zarrett, Melissa George, Kim Hills, Brad Smith, and Will Canu. Thanks to my first mentor, Will Canu, who provided early opportunities for strong research experience and guided me through the development and implementation of my senior honors thesis. These formative experiences sparked early my interest in the field of school psychology and later, led to my first research publication and acceptance into USC's graduate program. Thank you to Brad for the great opportunities to get involved in research and intervention practices through the Challenging Horizons Program (CHP) and to Mark, Nicole, Melissa, and Kim for promoting the continued growth of my interests in research and my commitment to high-quality practice in school psychology.

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ABSTRACT

High school dropout (HSDO) is associated with poor life outcomes across many domains. As such, it is crucial to understand and identify the factors that contribute to HSDO risk early to increase the chance of positive student outcomes. Because students at-risk are heterogeneous, researchers recommend using pattern-centered approaches to identify subpopulations with similar risk profiles to better understand various typologies of risk. This may be a more comprehensive and accurate way to understand students at-risk for HSDO and may facilitate the development of more effective interventions. To date, seven empirical studies have used a pattern-centered approach to examine HSDO. However, risk is often studied narrowly (e.g., across one or two domains) and cross-sectional analyses are typically used. Additionally, this research often focuses on intrapersonal characteristics, which may neglect contextual influences such as peer relationships. The current study advances the HSDO literature by (a) testing a model which examines the possibility of different subpopulations of students at-risk for HSDO, (b) defining subpopulations by peer risk characteristics, a critical and understudied ecological risk, (c) studying longitudinal trajectories of change (i.e., growth or decline in peer risk factors), and, (d) examining the relationship that contextual support (i.e., support of a students' family, school, and community) has on the likelihood of belonging to certain peer risk trajectory patterns. Results are presented and future directions are discussed, as well as implications for schools and families.

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CHAPTER 1

INTRODUCTION

The consequences of high school dropout (HSDO) are significant across many domains and have an important impact on individual, social, and societal functioning. Moreover, the effects of HSDO often have lasting ramifications. As such, it is crucial for researchers, practitioners, families, and school personnel to understand and be able to identify the factors that may signify that a student is at risk for HSDO in order to increase the chances of positive outcomes for this group of students. The existing body of literature indicates that students who drop out of high school have many underlying concerns. Indeed, researchers have documented a variety of characteristics that contribute to HSDO across the individual (i.e., person-specific characteristics) and context (i.e., environmental contributors) and that there are unique within-group differences among students at-risk for HSDO. Few researchers, however, have examined typological differences among this group of students (Bowers & Sprott, 2012; Cairns, Cairns, & Neckerman, 1989; Fortin, Marcotte, Potvin, Royer, & Joly, 2006; Janosz, Le Blanc, Boulerice, & Tremblay, 2000; Korhonen, Linnanmaki, & Aunio, 2014; Muthen, 2004; Orpinas, Racynski, Peters, Colman, & Bandalos, 2014), with only two of these groups assessing longitudinal trajectories of change (i.e., growth or decline in risk factors) for youth at-risk for HSDO (Bowers & Sprott, 2012; Muthen, 2004). Further, although some researchers have assessed ecological risk factors (Bowers & Sprott, 2012; Janosz et al., 2000), few have examined peer risk (for exceptions see Cairnes et al., 1989; Janosz et al.,

2000) and no researchers have examined how support within the family, school, and community contexts impacts group membership to patterns of peer risk over time.

This paper provides a comprehensive review of the literature examining risk factors related to HSDO, focusing on factors within the peer context, which are often neglected in this area of research. A review of the existing studies that have used a pattern-centered approach to examine typological differences is also provided. Finally, gaps in previous literature are addressed by examining the likelihood of HSDO for high-risk students through testing a dynamic systems model (e.g., the Bioecological Model; Bronfenbrenner, 1979, 1986a, 1986b, 1989, 1995, 2001, 2005; Bronfenbrenner & Morris, 1998, 2006), which examines the possibility of different subpopulations of students at-risk for HSDO dependent on their peer relations. For the model used in the current study, risk subpopulations are defined by peer characteristics. Longitudinal trajectories of change (i.e., growth or decline in peer risk factors) are examined, as well as the relationship that contextual support in the family, school, and community has on group membership to each peer risk trajectory. Results are presented and implications for future research, practice, and policy are discussed.

1.1 Implications and Importance of Studying HSDO

The importance of identifying children at risk for HSDO gained national focus and widespread public attention in the mid-twentieth century when President John F. Kennedy's initiated his "Sumer Dropout Campaign of 1963," an initiative to increase publicity about the nation's HSDO crisis and assist school districts in identifying potential dropouts and helping them to return to school in the fall (Dorn, 1996). Since

that time, numerous studies and programs focusing on improving high school graduation rates in schools have been implemented at national, state, and local levels. For example, in 2008, America's promise Alliance introduced the Dropout Prevention Campaign, bringing together stakeholders to develop action plans to improve rates of high school graduation in high-risk communities (America's Promise Alliance, 2017). In addition, the Texas Education Agency offers numerous grants and initiatives targeting dropout prevention and recovery, with goals of implementing proven dropout prevention strategies, targeted to the needs of students at-risk for HSDO (Texas Education Agency, 2017).

Over the past fifteen years, the United States has made tremendous progress in improving overall high school graduation rates. Notably, national graduation rates increased from 71.1 percent (in 2001) to 86 percent (in 2014; U.S. Census Bureau Population Survey; October, 2014). Despite the progress the United States has made cumulatively; the likelihood of high school graduation varies widely among various sub-populations of students. For example, in 2012, over one-thousand ($n=1,359$) United States high schools were identified as "dropout factories" (i.e., schools that reported 12th grade enrollment as 60 percent or less, compared to ninth grade enrollment three years prior; Alliance for Excellent Education, 2011). Further, high school graduation rates remain lower for students from Hispanic (79%) and African American (82%) backgrounds, compared to those from Caucasian (89%) and Asian (91%) backgrounds (U.S. Census Bureau Population Survey; October, 2014). Despite the progress that schools have made in increasing rates of high school graduation, discrepancies, such as those described above, indicate that concerns related to this issue remain.

There are a number of reasons for the concern in recent decades to improve high school graduation rates for students. The consequences of HSDO are significant, negatively impacting individual, social, and societal functioning. HSDO is associated with person-specific complications, such as difficulties related to occupation, finance, health, and well-being. Compared to students who graduate from high school, students who leave without a diploma have higher rates of unemployment and underemployment (Coalition for Juvenile Justice, 2001; Sum, Khatiwada, McLaughlin, & Palma, 2009), as well as lower lifetime earnings (Rumberger & Lamb, 2003). In addition to occupational and financial difficulties, students who drop out of high school are also likely to have more health problems and have lower levels of well-being, compared to those who graduate (Bynner & Parsons, 2002; Hibbett, Fogelman, & Manor, 1990; Lamb, 2011; Muenning, 2005; Robins & Ratcliff, 1980).

In addition to being associated with poor life outcomes for the individual, HSDO is also related to contextual (e.g., social and societal) difficulties. Students who drop out of high school are likely to demonstrate social maladjustments, such as behavior disorders and delinquency, including higher rates of arrest (Coalition for Juvenile Justice, 2001), greater involvement in interpersonal violence (Jarjoura, 1993), and have a greater prevalence of both licit and illicit substance abuse (Coalition for Juvenile Justice, 2001; Mensch & Kandel, 1988; Swaim, Beauvais, Chavez, & Oetting, 1997). Additionally, HSDO is associated with broad, societal costs related to increased reliance on public assistance (e.g., welfare) and reduced taxation revenue, compared to high school completion (Garnier, Stein, & Jacobs, 1997; Owens, 2004). Because the negative consequences of HSDO are significant across individuals and contexts (e.g., peers and

society), it is crucial that researchers, practitioners, families, and school personnel understand and are able to identify those at-risk for HSDO in order to develop and implement intervention programs to improve the likelihood of high school graduation. Further, understanding how support in contexts such as the family, school, and community relates to school outcomes, may reveal specific contexts that are most important to target preventative efforts to promote positive school outcomes for high-risk youth.

A large body of research has been dedicated to understanding relationships among characteristics associated with HSDO. This research has consistently shown that youth who dropout of high school are likely to present certain person-specific and context-specific vulnerabilities, compared to graduates. However, certain limitations exist in how HSDO has been identified and measured.

1.2 Defining Who is At-Risk

There seems to be a consensus among contemporary researchers that HSDO should be defined using a broad framework that is composed of both person-specific and context-specific interactions across and within multiple domains of functioning (see review by Rumberger, 2011; p. 159-206). Additionally, researchers appear to agree that, rather than one specific event, HSDO is the result of an integrated and interactive process that develops over time as difficulties across systems accumulate and access to resources decline and this process may differ for diverse groups of students (Alexander, Entwisle, & Kabbani, 2001; Bowers, 2010; Bowers & Spratt, 2012; Entwisle, 1990; Finn, 1989; Rumberger & Palardy, 2005).

A comprehensive review of the literature indicated that there exists a more thorough literature base of findings from studies examining person-specific indicators of HSDO, compared to contextual indicators (Rumberger, 2011). Fewer researchers have examined context-specific indicators, with peer and neighborhood/community characteristics appearing particularly absent in the current HSDO literature. Collectively, however, findings provide evidence that students at-risk for HSDO experience a multitude of diverse person-specific and context-specific characteristics that, in concert either facilitate or create barriers to high school success and completion. These characteristics interact across and within multiple contexts of the bioecological system including individual, family, peers, school, and neighborhood/community. The multitude and diversity of risk factors cited in the current literature suggest that HSDO is a complex process and provide evidence that there is no single combination of factors that leads to dropping out of school. Rather, many diverse factors interact, accumulate over time, and via multiple pathways, ultimately lead to HSDO or graduation (Alexander et al., 2001; Rumberger, 2011; Woods, 1995). Despite this recognition, it is unclear which combinations of indicators are most influential for specific groups of students. Understanding unique sets of characteristics that signal HSDO risk may help school personnel, clinicians, and families to identify students who may be at-risk and may help researchers to design and examine tailored interventions, targeting combined person- and context-specific indicators for unique profiles of HSDO risk.

The collection of studies by researchers who have examined HSDO has contributed to a comprehensive understanding that incorporates the developmental process of HSDO and has allowed for specification of numerous risk contributors.

Accordingly, this understanding has facilitated the conceptualization, examination, and implementation of evidence-based strategies to prevent HSDO, such as interventions that aim to increase student engagement or decrease behavior problems in school (for example, see strategies provided by the National Dropout Prevention Center/Network at Clemson University; “Effective Strategies,” 2015). Despite these advancements, limitations in the existing literature prevent researchers, practitioners, and school personnel from obtaining an accurate and comprehensive understanding of the complex processes leading to HSDO. There are two approaches for understanding HSDO risk: variable-centered and pattern-centered approaches. Both approaches have different strengths and limitations for understanding HSDO.

1.3 Approaches for Understanding HSDO Risk

The variable approach. Findings from previous studies reinforce the consensus among researchers in the field that the pathway to HSDO is dynamically complex and diverse across different subpopulations (i.e., subgroups) of students. However, the current definitions and methodologies for studying HSDO reflect an assumption that students at-risk for HSDO represent a homogenous group, implying that all students who are at-risk are identifiable based on the same set of risk indicators. Statistical methods utilized in the current HSDO literature are most often based upon variable approaches (see Figure 1.1), described by Magnusson (2003) and summarized in brief here. The variable approach focuses on the relation between individuals’ positions on latent dimensions (e.g., k [peer support for learning] and l [peer acceptance] in Figure 1.1), statistically studied across individuals in cross-sectional or longitudinal studies. For example, Figure 1.1 represents a statistical correlation between data for the positions of individuals A, B, C, and D and the

latent dimensions k and l . Variable approaches are commonly used in psychological research, including research examining HSDO (e.g., comparisons between means and other location parameters, correlation and regression analyses, factor analyses, structural equation modeling, and contingency tables). Studies applying this method yield answers to questions about relationships among variables at the group level and generalizations are made in group-level terms. The variable approach is often used to understand how specific characteristics or variables function within a broad population of students. This approach allows researchers to identify and compare multiple indicators of risk (or resilience) at the group level, to better understand how the majority of individuals in the group function. For example, Figure 1.1 demonstrates how the variable approach allows researchers to examine students' functioning as a group in terms of peer support for learning and peer acceptance. Results from studies applying the variable approach are important for informing intervention or curricula development for large, normative populations of students.

An important assumption when using the variable approach is that the relationship among variables studied at the group level can be used to make inferences about how the variables function within individuals. However, this approach does not capture the complexity of individual functioning; it lacks support for studying the individual, their system, and their totality of functioning (e.g., interactions within and between multiple domains of functioning that evolve over time; Bergman, Magnusson, & El-Khoury, 2003; Bronfenbrenner, 1979, 1986a, 1986b, 1989, 1995, 2001, 2005; Bronfenbrenner & Morris, 1998, 2006; Magnusson, 2003). The variable approach examines individuals at the group-level, producing one aggregate score for an entire group of students. This often leads to

exclusion of key information about individuals that do not fall within the average range of functioning, relative to others in the larger group (e.g., outliers). Therefore, results from studies applying the variable approach cannot be generalized to understand the complexity of the integrated and holistic developmental processes of individual functioning.

Based upon the diversity of variables reviewed in the current HSDO literature, it is unlikely that all students who dropout of high school exhibit the same characteristics and follow the same developmental pathway. Instead, students who drop out of high school are likely to fall into different subpopulations of students, who exhibit different patterns of risk (i.e., risk typologies), compared to other at-risk peers. Therefore, using typological approaches, such as those that are profile or pattern-centered, are ideal for understanding risk for HSDO.

Typological approaches to understanding HSDO risk. Because the number of risk indicators for HSDO is substantial and varies greatly across existing studies, some researchers have hypothesized that students who are at-risk for HSDO represent a heterogeneous group and may vary categorically based on typologies or patterns of risk indicators (Bowers & Sprott, 2012; Cairns et al., 1989; Fortin et al., 2006; Janosz et al., 2000; Korhonen et al., 2014; Muthen, 2004; Orpinas et al., 2014). An early conceptualization of this typological view of HSDO was presented by Kronick & Hargis' (1990; 1998) in their early model of HSDO (see Figure 1.2). The authors purported that students who leave school without a diploma fall into typologies that represent four distinct subgroups, composed of various combinations of person-specific indicators (including behavior, academic, and engagement problems): *Quiet Dropouts* (i.e.,

students with low behavior problems, but high academic problems, who quietly disengage from school and dropout of high school), *Pushouts: Behavior problems as the result of failure*, (i.e., behavior problems in school cause poor academic performance, which then leads to disengagement and HSDO), *Pushouts: Behavior problems as the cause of HSDO* (i.e., behavior problems in school lead directly to HSDO), and *In-school dropouts* (i.e., students who attend school regularly and complete their final exams but receive a failing score). In this model, students' risks are primarily defined by vulnerabilities that are person-specific (e.g., behavior, academics, disengagement). However, it is likely that contextual factors, such as family support, the culture of a school environment, or social factors in a students' neighborhood or community, may also contribute to a student's likelihood of high school graduation or dropout.

Rumberger and Ah Lim (2008) proposed a conceptual model of student performance in high school (presented in Figure 1.3), suggesting that students' person-specific characteristics are influenced by three institutional contexts: families, schools, and communities (see Rumberger, 2011). Support for this model is provided by a number of studies that cited diverse reasons students provide for leaving school. One of the most widely referenced of these studies is *The Silent Epidemic* by Bridgeland, Dilulio, and Burke Morison (2006), who found that the reasons students provided for leaving school early without a diploma fell into three major categories: school-related reasons (83 percent), job-related reasons (35 percent), and family-related reasons (34 percent). Together, findings from these studies indicate that there are a wide array of factors that contribute to a student's decision to drop out of high school. Some involve students' individual attitudes, behaviors, and performance, such as missing school, poor grades, or

not feeling engaged in school. Others involve features of schools themselves, such as classes not being interesting or resources available in schools. Still others suggest factors outside of school such as getting a job, becoming pregnant, family stress, or family resources. Together, these studies underscore the argument that HSDO is not caused by one specific factor, but an array of factors and these factors may be different for different students. Thus, students with different types of risks would likely benefit from different types of interventions.

Use of typological approaches for understanding subpopulations of students at-risk for HSDO results in a comprehensive view of HSDO that acknowledges the complexities of individual functioning and may lead to the development of tailored interventions that are highly applicable to individuals. Typological approaches provide the initial steps to improving integration among studies and helps to improve understanding of totality of functioning in understanding HSDO risk. One type of typological approach that has gained popularity over the past few decades in examining subpopulations, is the pattern-centered approach (Bergman et al., 2003), described next.

Pattern-centered approaches. In recent decades, researchers have sought to identify risk typologies of HSDO by examining characteristics that cluster together within a larger group of at-risk students; e.g., Fortin et al., 2006; Janosz et al., 2000; Korhonen et al., 1990). This approach is referred to a pattern-centered or person-centered approach (Bergman et al., 2003; Magnusson, 2003) which often employ cluster analyses or profile analytical methods.

A large body of research has been conducted to identify and measure patterns among characteristics or risk factors associated with student outcomes. In contrast to the traditional variable approach, the pattern-centered approach is based on the understanding that there are unique patterns of variation among different groups of individuals, which increases or decreases risk for HSDO. This approach provides a method of studying unique latent profiles of risk in order to improve identification of at-risk students, better understand students' diverse needs, and develop effective intervention and prevention strategies to address students' unique needs.

According to the pattern-centered approach (presented in Figure 1.4; also see Magnusson, 2003 for review), a single piece of data for an individual student (e.g., individual A on latent dimension k [peer support for learning] in Figure 1.4) derives its importance based on its position in a pattern of data for the same individual (positions on the latent dimensions l [peer acceptance], m [peer conflict], and n [negative peer influence]). Latent dimensions represent components that are simultaneously working together in the system being studied (Magnusson, 2003). For example, an individual's level of peer support for learning can be better understood by examining his or her position on that dimension, while simultaneously assessing their position on other latent peer-risk indicators (e.g., peer acceptance, peer conflict, and negative peer influence). Use of this method demonstrates the value gained in seeking to understand an individual's totality of functioning and may allow researchers to gain a more holistic understanding of the multiple factors operating simultaneously within an individual. Application of the pattern-centered approach is consistent with person-environment models of development, such as the *Expectancy-Value Theory* (Eccles & Hearld, 1991;

Eccles & Wigfield, 2002), the *Bioecological Model of Human Development* (Bronfenbrenner, 1979, 1986a, 1986b, 1989, 1995, 2001, 2005; Bronfenbrenner & Morris, 1998, 2006), and *Holistic-Interactionism* (Bergman et al., 2003; Magnusson, 2003), which emphasize the combination of person and environment holism and totality in understanding the individual as an organized system, functioning across time as an active element of an integrated person-environment system.

Studies that use this approach to examine HSDO risk yield information reflecting totality of functioning, describing the individual in combination with his or her system. Figure 1.5 shows that the same position for different individuals (e.g., individuals A, E, F) on one latent dimension may differ in its significance to the combined functioning of individuals in the group (see Magnusson, 2003 for review), which has important implications for identification and treatment. For example, Figure 1.5 shows that it is not until a characteristic (e.g., peer support) is examined in combination with other simultaneously working characteristics (e.g., peer support, family stress, teacher-student relationship) that it can lead to conclusions. Thus, use of the pattern-centered approach is crucial for accurately and comprehensively understanding individual functioning.

The primary purposes of the pattern-centered approach are to (a) identify groups of individuals who function in a similar way at the organism level being investigated and in a different way, relative to individuals at the same level, and (b) analyze short-term and long-term developmental processes based on patterns. Use of the pattern-centered approach to understand human functioning is in accordance with views of functioning that emphasize the interrelationship among multiple variables and how they work

together in unison to influence a student's functioning and outcomes (Bergman et al., 2003; Magnusson, 2003).

In the past, researchers studying risk for HSDO have most often used variable approaches in their methodologies. However, findings generated from studies examining students at the group-level, may not yield an accurate representation of all individuals at-risk for HSDO. In contrast, use of the pattern-centered approach allows for examination of inter-individual differences among multiple subgroups in a population of students at-risk for HSDO. This approach provides a framework and a method of measurement that reflects the current consensus of researchers within the field who endorse a view of HSDO that is described by interactionism among diverse indicators that develop over time. Furthermore, the pattern-centered approach allows for an understanding of how certain components of a students' intrapersonal characteristics, combined with their environmental experiences, operate simultaneously in integrated individual processes. Ultimately, the pattern-centered approach provides a framework and methodology to conduct studies that may yield a more accurate, comprehensive, and specific understanding of the diversity of risk typologies (i.e., subpopulations) among a larger group of at-risk students. Identification of students' unique profiles (i.e., typologies) may allow for a more accurate understanding of diverse risks of individual risks among students. In a comprehensive review, seven empirical studies were identified since the late 1980s, that used a pattern-centered approach to examine HSDO risk, presented next.

Using a pattern-centered approach to understand HSDO. Seven studies were identified in which researchers have used various methodologies to implement a pattern-centered approach to examine HSDO (Bowers & Sprott, 2012; Cairns et al., 1989; Fortin

et al., 2006; Janosz et al., 2000; Korhonen et al., 2014; Muthen, 2004; Orpinas et al., 2014), as seen in Table 1. Findings from these studies have made important contributions to the HSDO literature by highlighting the need to understand individual differences among students at-risk for HSDO and by using person-environment models to examine risks, which is consistent with the current conceptualization of HSDO. These studies also represent important methodological and theoretical shifts in the understanding of processes involved in the development of HSDO over time.

Janosz and colleagues (2000) identified four latent profiles of students at-risk for HSDO using data from 797 white, French-speaking adolescents from Montreal (grades 7-9), who were interviewed in 1985. These researchers examined multiple areas of risk across person-specific domains (e.g., grades, retention, attitude toward school, drug use, delinquency), as well as several contexts: family (e.g., parent education level, SES, family disruption), peers (e.g., similarity to one's peers, peer leadership, exposure to deviant peers), and school (e.g., social context of delinquency in school). This study made important contributions to the field, by broadening the scope of the study of HSDO risk through examining multiple domains of risks across person and context, as well as empirically identifying unique typologies of risk for students, and thus, increasing understanding of patterns that may contribute to HSDO.

In a tutorial describing growth mixture modeling, a type of pattern-centered analysis, Muthen (2004) assessed person-specific indicators of math achievement for students at-risk for HSDO, during grades seven through ten, and identified multiple unobserved trajectory patterns based on achievement patterns. Building on the methodology presented by Muthen (2004), more recently, Bowers and Sprott (2012)

made particularly noteworthy contributions by using pattern-centered analyses to identify two unobserved groups for students at-risk for HSDO: expected dropouts (i.e., those with low non-cumulative grade point averages, that became lower over the three-year study), verses unexpected dropouts (i.e., those that began with moderate non-cumulative grade point averages, that became lower throughout the study). After identifying these patterns, the researchers used mediation analyses to examine the impact of both person-specific (e.g., gender, race, SES, behavior infractions, attendance, extracurricular participation) and environmental (e.g., school size, locale, student-teacher ratio, level of school-wide academic pressure) vulnerabilities on pattern changes.

Despite noteworthy contributions described in the studies reviewed above, examination of the remainder of the identified studies, suggests that patterns of HSDO risk are typically examined by using cross-sectional analyses, either retrospectively (i.e., examining student characteristics at a single point in time for students who already dropped out of high school) or prospectively (i.e., examining student characteristics at a single point in time and assessing whether or not they dropped out of school at a later point). Thus, the complex processes and mechanisms contributing to HSDO may not be fully understood. Further, examination of risk at a single point of time is inconsistent with the current understanding of human development, which calls for the use of process-oriented models that allow for the assessment of changes in patterns and dynamics over (Elder, 1998).

Importantly, studying adolescent populations, developmental transitions that occur during adolescence that are normative (e.g., the transition from middle school to high school, changes in peer group, physical and cognitive changes associated with

puberty) and non-normative (e.g., school expulsion, parental divorce, parental loss of job) should be considered. These types of developmental transitions may affect the manifestation of behavior problems and may lead to difficulties with academic performance or in family functioning, all of which could change the course of high school graduation for a student, and possibly lead to dropout (e.g., see Nurmi, Poole, & Seginer, 1995). Implementing studies with designs that assess the relationship among multiple domains and the developmental trajectories of HSDO risk (i.e., across multiple time points), therefore, may help to articulate the complex processes involved in HSDO for adolescents. Findings from these studies may also alert clinicians, parents, and school personnel to specific time points in development that certain patterns of risk indicators are most important in influencing HSDO, which may lead to better methods of identification and the development of more individually tailored interventions for at-risk students.

The current literature with findings of researchers who have used pattern-centered approaches to examine HSDO, have made important contributions to the HSDO literature in increasing understanding of the diverse domains that contribute to HSDO risk. These contributions represent a shift in the field in improving how risk for HSDO is assessed by examining the impact of multiple domains of functioning on student outcomes, which is consistent with the Bioecological Systems Model of human development (Bronfenbrenner, 1979, 1986a, 1986b, 1989, 1995, 2001, 2005; Bronfenbrenner & Morris, 1998, 2006), as well as using process-oriented models (Elder, 1998) to examine human development overtime. Although the importance of using models that assess multiple domains over-time is often agreed upon among developmental researchers,

domains represented in the current literature are often unequally distributed across individual and contextual domains. Although there appears to be a strong representation among person-specific factors in the current literature, contextual factors may be under-represented. Specifically, broad contextual factors, including school and community indicators, appear particularly absent in the literature.

Collectively, results from studies examined in the HSDO literature suggests that many person- and context-specific factors interact in complex ways to increase or decrease the likelihood of HSDO. The diversity of influences that are present in the current HSDO literature provide evidence that HSDO is a multifaceted problem that likely requires a multi-dimensional approach to understand its complexity. Although previous researchers have documented diverse aspects of person-specific and environment-specific characteristics that contribute to HSDO risk, only one research group was identified that examined the combined impact that person and environment domains have in adolescent development, and how these relationships change over time (Bowers & Sprott, 2012). Further, to date, no researchers have examined peer risk trajectories of students at-risk for HSDO and how family, school, and community supports influence those trajectories. Because a student's peer group is considered one of the strongest influencers during adolescence (Smetana, Campione-Barr, & Metzger, 2006), peer vulnerabilities most frequently documented in the HSDO literature are described next, followed by risk indicators related to the family, school, and community contexts.

1.4 Peer Vulnerabilities

Adolescence is characterized by rapid change in many domains of development (see Collins & Steinberg, 2006). One of these areas is in youths' social lives (for review, see Smetana et al., 2006), as youth begin access peers, rather than parents and family, as their primary source of social interaction and support (Brown & Larson, 2009). During the adolescent period of life, youth are presented with the task of identity development (Erikson, 1968), with a primary focus of developing independence and identity. It is during this stage that they seek to define their beliefs, values, and goals, as an individual, apart from those of their parents. They may begin questioning their parents' rules and behaviors and immerse themselves in their own social environment in attempt to increase autonomy and explore their identity. As a result of this new focus, individuals become more susceptible to peer pressure during adolescence, especially during their early teenage years (Eccles, 1999).

Given the important role that youths' peers play in identity development during the adolescence period, it is not surprising that their peer group also makes important contributions to how youth understand the world and process information. In terms of social-cognition, the need to belong and fit in increases during adolescence (Brown & Lohr, 1987; Doremus-Fitzwater et al., 2010; Somerville et al., 2010). Some researchers have suggested that, compared to other stages, social influences may be more strongly related to reward processing and decision making during this stage (e.g., Welborn, Lieberman, Goldenberg, Fulgini, Galvan, & Telzer; 2015). As a result of this shift, youth may be more susceptible to peer influences during this stage.

Due to the vast changes that youth experience during adolescence (e.g., biological, cognitive maturation, societal expectations; Collins & Steinberg, 2006), peer relationships are also likely to change and evolve as youth progress through this stage. For example, as youth begin interacting with a larger group of peers in early adolescence (compared to parents or family in previous stages), youth are presented with more opportunities for deviant influence, such as increased access to substances (e.g., alcohol, tobacco) or participation in social functions where substances may be available (Ennett et al., 2006; Valente et al., 2005). Once children enter adolescence, risky behaviors may be maintained through relationships with other youth engaging in risky and delinquent activities (Eisenberg, Toumbourou, Catalano, Hemphill, 2014; Haynie, 2002; Reynolds & Crea, 2015). Social learning theory suggests that affiliation with delinquent peer groups may reinforce dominant peer norms, making youth more likely to adopt these types of behaviors in order to gain and maintain group membership (Petratis, Flay, & Miller, 1995).

Neurological changes during adolescence may also partially explain why youth may become more susceptible to peer influence during adolescence. As youth progress through the adolescence stage, the neural regions associated with functions such as mental state reasoning become more precisely adapted to comprehend and manage affective, cognitive, and social demands that accompany adolescence (Welborn et al., 2015). This may partially explain why youth experience more turbulent relationships during early adolescence, compared to late adolescence (e.g, Ladd & Ettekal, 2013).

In addition to intrinsic brain-based changes that occur during adolescence, the context of the environment may also influence an adolescent's functioning, including

their relationships with peers. For example, access to a variety of high-quality extracurricular activities, may offer youth more opportunities to engage with and form positive peer relationships (Peck et al., 2008). In contrast, youth who are not involved in high-quality extracurricular activities may have fewer opportunities for positive interactions with peers and developing positive peer relationships (Gifford-Smith, et al., 2005).

Although it is well known that peers have an important role in adolescent development during the teenage years, little is known about unique combinations of students' peer characteristics (e.g., support, acceptance, conflict, influence) and how trajectories of these characteristics affect student outcomes, such as a students' likelihood of HSDO or graduation. Compared to other contexts of development (e.g., person, family, school), no researchers to date have examined the role that a student's peers have in influencing his or her likelihood of HSDO. However, some support exists from researchers who have documented the important role that a student's peers play in regards to peer support for learning, peer acceptance, peer conflict, and negative peer influence on school outcomes.

Peer support for learning. The support an adolescent receives from his or her peer group in relation to school functioning, has been associated with positive school outcomes. Proactive social interventions at the schoolwide- classroom- and individual-levels have demonstrated improvements in student behaviors within the school setting, including areas of attendance, self-esteem, externalizing behaviors, bullying, and emotional support (Roffey, Majors, & Tarrant, 1997). For example, at the classroom-level, adolescents involved in cooperative learning groups have demonstrated higher

achievement scores, compared to those not involved in cooperative learning groups (Bertucci, Johnson, Johnson, & Conte, 2012). Additionally, social competence has been positively associated with academic performance (Oberle, 2013; Zorza, Marino, de Lemus, & Mesas, 2013) and may influence positive school outcomes such as high school graduation. In contrast, low levels of social support have been associated with depressive symptoms (Segrin, 2000; Segrin & Rynes, 2009; Thompson, Flood, Goodvin, 2006), which may create barriers to high school graduation.

Peer acceptance. There is a growing body of research, with investigators documenting the association between peer acceptance and various school outcomes (Bierman, 2004; Cole, 1990; Hawkins, Lishner, Catalano, & Howard, 1986), including academic performance (Benner, 2011; Bierman, 2004; Cole, 1990; Hinshaw, 1992; Fite, Hendrickson, Rubens, Gabrielli, & Evans, 2013; Shin, Daly, & Vera, 2007). For example, youth who become more accepted by peers over time show improvements in school functioning (Benner, 2011; Greenman, Schneider, & Tomada, 2009). In contrast, rejection in Kindergarten predicts a decline in school engagement (e.g., participation in classroom activities, school avoidance) by the fifth grade (Buhs, Ladd, & Herald, 2006). Youth who are consistently rejected by peers display consistent academic difficulties throughout school, compared to those who are accepted (Greenman et al., 2009). Further, there is some research to support that youth who are rejected by peers may become less invested in norms of conventional social institutions (such as school), thus increasing their risk for problem behaviors and academic difficulties (e.g., Bierman, 2004; Dodge et al., 2003; Prinstein & Aikins, 2004; Prinstein, Boergers, Spirito, Little, & Grapentine, 2000).

Peer conflict. Peer conflict (e.g., peer aggression, harassment, victimization, and conflict) has been documented as a relatively common social experience in adolescence, with over 30% of school-age children reporting that they have been in a physical fight and almost 50% of youth reporting that they have been involved in bullying (WHO, 2002). Over time, youth who experience increased levels of peer conflict may have difficulties in various domains of functioning, such as social, psychological, and academic contexts (Dodge, Cole, & Lynam, 2006; Graham, Bellmore, & Mize, 2006), which may create barriers to school success. Results from one study indicated that perceived teasing and bullying in the ninth grade predicted HSDO four years later (Cornell, Gregory, Huang, & Fan, 2013). Another research group examined eighth grade South African students and found that the girls who were identified as both bullies and victims of bullying were more likely to drop out of high school, compared to girls who were identified as only bullies or only victims (Townsend, Fisher, Chikobvu, Lombard, & King, 2008). In general, stressful peer experiences (e.g., aggression, harassment, victimization, and general conflict) may impact functioning across multiple contexts, including in academic settings. These experiences may contribute to difficulties with behavioral adjustment and academic difficulties (e.g., Boivin, Hymel, & Hodges, 2001; Juvonen, Nishina, & Graham, 2000), whereas positive peer experiences may facilitate positive adjustment and academic success.

Negative peer influence. A growing number of researchers have documented the important role of social networks and peer groups in influencing youths' academic beliefs and social behaviors (Rodkin & Ryan, 2012; see review by Kronick & Hargis, 1998). Affiliations with certain cliques or crowds may influence students' friendships and daily

activities (Brown & Klute, 2003). For example, students who are highly engaged in school are likely to seek like-minded academically-oriented peers who foster these school engagement behaviors. Such affiliations may lead to a greater likelihood of academic success and school completion. In contrast, students who are disengaged in school are more likely to become involved in non-academically-oriented friendships with peers. Immersion in these antisocial peer networks may lead to disengagement in school, and result in less socially acceptable outcomes such as academic failure and HSDO (Ream & Rumberger, 2008). Additionally, as students are likely to become more like their friends in attitude, behavioral tendencies, and interactions over time (Veenstra & Steglich, 2012), spending time with peers who are unmotivated, disengaged, and low-achieving, may lessen motivation, engagement, and academic achievement for the individual (Shin & Ryan, 2014).

Further, peer characteristics interact with one another and may influence other characteristics within the social context. For example, supportive peer interactions provide a context that may help youth develop social competencies and validate self-identity, ultimately promoting positive adjustment (Gifford-Smith & Brownell, 2003). Furthermore, a students' functioning in other contexts (e.g., family, community) may impact the characteristics of one's peers. For example, youths' involvement in activities within their communities, such as sports participation, is associated with positive social development (Barber, Eccles, & Stone, 2001; Brunelle, Danish, & Forneris, 2007). Further, a strong parent-child attachment predicts youth development of supportive peer relationships, leading to fewer negative expectations and lower levels of depressive symptoms (Yih-Lan, 2006), which may increase opportunities for positive school

outcomes. In contrast, low parental involvement may predict poor parental monitoring, increasing an adolescent's opportunities to associate with deviant peers and increasing the likelihood of difficulties in other domains (Ary, Duncan, Duncan, & Hops, 1999).

Importantly, social development is adaptive and changes over time based on interactions of person and environment factors (Magnusson et al., 2003). Combinations of these interactions that grow more positive over time may lead to more positive outcomes, such as high school graduation, while combinations that grow more negative over time may lead to poorer outcomes, such as HSDO. Despite patterns of risk that are generally "positive" or "negative," certain combinations of characteristics may substantially increase risk. For example, being from a low SES background has shown to greatly increase risk for HSDO, due to its association numerous barriers to school success (Mayer, 1991). Similarly, despite generally negative patterns of functioning, certain combinations of characteristics within a student's context may substantially mitigate his or her risk. These are referred to as "protective factors" in the developmental literature. Although few researchers have examined how family, school, and community contexts affect peer risk trajectories and HSDO, it is likely that certain combinations of factors may off-set risk. Further, certain peer characteristics, embedded within other social contexts may also act as protective or even promotive characteristics, despite peer-related risks.

1.5 Peer Characteristics Embedded Within the Family, School, and Community

Some research suggests that the distinction between students who drop out of school and those who graduate can be explained by contextual differences within

families, schools, and communities, particularly differences in available resources within each of these settings (e.g., Mayer, 1991). Contexts with higher levels of support, including access to resources, may increase the likelihood of positive school outcomes, including high school graduation, for at-risk youth.

Family support. Researchers have studied a variety of characteristics related to a student's family context in order to better understand its impact on school outcomes. Several protective factors have been documented within the family context, including family support for learning, positive and involved parenting, low levels of stress in the family environment, and family access to rehabilitation services. These characteristics may off-set the risks of HSDO for youth with risky peer characteristics.

Family support and positive parenting practices have been documented as important predictors of school success. Schools implementing interventions to increase family support (e.g., building a foundation of trust and respect, connecting parent-engagement strategies to learning objectives in school) have demonstrated positive effects on students' learning outcomes and increased achievement in school (Henderson & Mapp, 2002). Family support for learning has been shown to directly increase the likelihood of high school completion (Mapp, 2004). Positive parenting practices, including parental involvement, has been cited as one of the most accurate predictors of a students' school success, including school completion (Henderson & Mapp, 2002). The relationship between positive parenting and school success has been observed across varying levels of Socioeconomic Status (SES), race, ethnicity, and educational background for students of all ages (Mapp, 2004). Parenting practices that emphasize low emotional support, minimal involvement in school activities, and poor parental

supervision have been strongly associated with HSDO (Battin-Pearson et al., 1999; Finn & Rock, 1997; McNeal, 1999; Potvin et al., 1999). Interventions to improve positive parenting practices, such as the *Triple P Positive Parenting Program* (Sanders 1999) and the *The Incredible Years* (Webster-Stratton, Reid, & Stoolmiller; 2008) have shown to increase positive school outcomes. Students who do not complete high school often describe having poor relationships with their parents (Potvin et al., 1999) and frequent family conflicts (Gillock & Reyes, 1999; Walker, Grantham-McGregor, Himes, Williams, & Duff, 1998). Such family-related difficulties may lead to fewer opportunities for positive relationships, including within the peer context, creating barriers to educational success.

Characteristics contributing to the level of stress within the family environment (e.g., family conflict, turmoil, and transience) have been documented as risk factors for HSDO. Stressful family events may include many diverse occurrences, however, all of these events may create turmoil and stress within the family environment. Lessard and colleagues (2008) asked students who dropped out of high school to describe the events precipitating their decision, most of the students described themes of family turmoil (e.g., divorce, parental neglect, parental criminal activities, placement of the child in foster care, death of a parent). Transience, including frequent educational or residential mobility, or frequent parental job shifts, has also been shown as a stressor that negatively influences school functioning, including HSDO (Gasper, DeLuca, & Estacion, 2012; Orthner and Randolph, 1999; Ream & Stanton-Salazar, 2007; Rumberger and Larson, 1998). In a review, Rumberger (2011) describes that it is not these events alone that lead to HSDO. Increased exposure to stressful family events may contribute to instability and

poor structure within the family context, which in turn, creates barriers for students (e.g., decreased access to resources, fewer opportunities to develop positive friendships), complicating the pathway to school success. Additionally, these family environment stressors may interact with other stressors, such as person-specific vulnerabilities (e.g., anxiety, depression, adjustment difficulties) and vulnerabilities within other contexts (e.g., poor peer relationships, peer conflict), creating additional barriers to school success, including high school graduation (Neighbors & Forehand, 1997). In contrast, researchers examining protective factors for HSDO have found that students who reside in supportive and stable households (e.g., students living with both parents and those with minimal mobility (Perreira, Harris, & Lee, 2006; Rumberger, 1995) have a higher likelihood of graduation, even after controlling for prior achievement and other factors (Herbers, Reynolds, & Chen, 2013).

A variety of characteristics within the family context (e.g., support, involvement, conflict, stress, resources) may affect student outcomes, particularly when combined with intrapersonal difficulties or difficulties in other contexts (e.g., school, community, peers; Rumberger, 2011). Many family interventions have been developed to improve parenting, family functioning, family relationships, and coordinated care for treatment of parents' psychiatric problems such as the *Triple P Positive Parenting Program* (Sanders 1999), *The Incredible Years* (Webster-Stratton et al., 2008) and *Family Options* (Nicholson, Albert, Gershenson, Williams, & Biebel, 2009). Families who live in communities where these types of intervention programs are widely available, have fewer behavioral problems and emotional problems (Sanders, Ralph, Sofronoff, Gardiner, Thompson, Dwyer, & Bidwell, 2008). Students whose families are able to access

rehabilitation services to address difficulties in the family environment have improvement in positive communication, problem-solving, and reductions in behavior problems at home and at school (Nowak & Heinrichs, 2008; Sanders et al., 2008; Webster-Stratton & Reid, 2000). Improvement in family functioning, as well as areas important for school functioning, such as behavior, communication, and problem-solving skills may increase the likelihood of positive school outcomes for youth.

School support. Although certain characteristics within the family context are often cited as impacting likelihood of HSDO, these characteristics do not occur independently of the larger environment, which, in addition to family includes school, peers, and community contexts. Because of the considerable amount of time that youth spend at school (e.g., the Bureau of Labor Statistics [2014] estimates 29 to 33 hours each week), it is likely that characteristics within the school environment also play an important role in school performance and completion. One of the most frequently cited protective factors within the school environment is teacher support.

The relationship a student has with his or her classroom teachers has been considered a critical determinant of a student's development, functioning, and achievement (Lynch & Cicchetti, 1992; Pianta, 1994; Pianta & Steinberg, 1992; Pianta, Steinberg, & Rollins, 1995; Sroufe & Jacobvitz, 1989). Students who feel connected to, cared for, and supported by their teachers report attitudes of inquiry and enjoyment towards learning, are more motivated to do well in school, and ultimately, have better learning outcomes (Goodenow, 1993; Lin, Yang, & Lai, 2013; Telli, den Brok, & Cakiroglu, 2010), including better academic performance, lower rates of depression and misconduct, and higher rates of school completion (Wang, Brinkworth, & Eccles, 2013).

In contrast, students who dropped out of high school reported poor relationships with teachers and low teacher support, often perceiving their teachers as controlling and uninterested in their success (Vallerand & Senecal, 1993).

Community support. Communities play a critical role in adolescent development, along with the other contexts discussed (families, peers, school). Unique characteristics of the community in which an individual resides, influences youth through mechanisms that increase access to social, academic, and occupational success (Rumberger, 2011). The most frequently cited protective factor within the community context is an adolescent's access to community resources. Certain characteristics of communities (e.g., percentage of people holding white-collar jobs, percentage of people living in poverty) have been associated with students' likelihood of high school graduation (Brooks-Gunn, Duncan, Kato Klebanov & Sealand, 1993).

Numerous researchers have documented the predictive relationship between living in an underserved community and school related difficulties, including HSDO. However, it is not the community alone that increases risk, but the associated life difficulties and decreased access to resources that leads to poor school outcomes (Rumberger, 2011). For example, compared to youth living in resource-rich communities, youth who reside in low-resource neighborhoods often have less access to institutional resources (e.g., child care, medical facilities, employment opportunities), access to social networks of mentoring, and have parents with less understanding of and power in schools (Crosnoe and Huston; 2007). Due to these limited resources, accumulated environmental stressors, as well as other barriers, youth from these communities may experience more disadvantages, compared to youth from affluent communities, which provide students

more access to community resources and positive role models from affluent neighbors (see Rumberger, 2011 for review). Additionally, access to positive (i.e., structured and supervised) extra-curricular activities within one's community, is documented to increase the likelihood of positive school outcomes for youth (Eccles & Gootman, 2002; Eccles & Templeton, 2002; Granger & Kane, 2004; Peck, Roeser, Zarrett, & Eccles, 2008; Ream & Rumberger, 2008; Roeser & Peck, 2003; Zarrett, Fay, Li, Carrano, Phelps, & Lerner., 2009). For students at-risk for educational difficulties (e.g., youth from low-income families, youth living in low-income neighborhoods), availability of and participation in extra-curricular activities may protect against negative school outcomes (Peck et al., 2008; Roeser & Peck, 2003). Together, level of access to community resources, combined with other characteristics within the family, school, and peer domains, may promote or inhibit likelihood of high school graduation for its inhabitants.

1.6 Additional Vulnerabilities Associated with HSDO

It is important to mention that although the present review focused primarily on contextual contributions to HSDO, there is an extensive base of literature of studies documenting strong relationships among HSDO and person-specific vulnerabilities, including intraindividual characteristics and family background characteristics. Notably, person-specific vulnerabilities appear more frequently in the HSDO literature, compared to contextual vulnerabilities (e.g., family, peers, school, community; see review by Rumberger, 2011).

Intraindividual characteristics. Some of the most frequently documented person-specific vulnerabilities contributing to HSDO include failing grades (i.e., receipt

of failing grades on report cards), internalizing problems, and externalizing problems. The link between poor academic achievement and high school dropout has been identified as early as Kindergarten (e.g., Hickman, Bartholomew, Mathwig, & Heinrich, 2008). These difficulties can be identified across every grade, with students who dropout of high school consistently performing more poorly than students who graduate (e.g., Hickman et al., 2008). Although a consistent progression of academic failure is evident for many of those who drop out of high school, this does not appear to be the developmental course for all students. Some students appear to exhibit difficulties during the transition from middle to high school, which subsequently changes their educational pathway. For example, when retrospectively comparing students who dropped out of high school to their peers who graduated, Pharris-Ciurej, Hirschman, and Willhoft (1999) identified a subgroup of students who exhibited an unpredicted decline in academic performance (i.e., a shift from high academic performance in the eighth grade to low academic performance in the ninth grade), which was termed “the ninth-grade shock,” (p. 710; Pharris-Ciurej et al., 1999), a key mechanism leading to HSDO. Despite differences in the manifestation or course of academic difficulties for students who drop out of high school, academic performance, including failing grades, often mediates the relationship between other risk indicators and HSDO (e.g., Battin-Person et al., 1999), such as student engagement, extracurricular involvement, and behavior.

Externalizing problems, including deviant behaviors (e.g., aggression, delinquency, and drug or alcohol abuse) are also frequently cited as a contributor to HSDO (Younge, Oetting, & Deffenbacher, 1996; Fortin & Picard, 1999; Royer, Desbiens, Bitadeau, Maltais, & Gagnon, 1999). In the classroom, deviant behaviors

often manifest as inappropriate or disruptive behavior, leading to frequent detentions, truancies, and expulsions from school (Alexander et al., 1997; Walker et al., 1998). These behavior difficulties may influence and be influenced by a number of factors, such as perceptions of one's peers, as well as the dynamics within one's family unit (e.g., see Lenzi, Sharkey, Vieno, Mayworm, Dogherty, & Nylund-Gibson, 2015; Litt, Stock, & Gibbons, 2015; Obando, Trujillo, & Trujillo, 2014). Behavior may also be influenced or maintained by school context, including a school's culture, as demonstrated in intervention studies (e.g., Barr & Higgins-D'Alessandro, 2009; Ferrans & Selman, 2014). Over time, repeated behavioral infractions may increase a students' likelihood of academic difficulties, school failure, and HSDO (Farmer & Payne, 1992; Gruskin, Campbell, & Paulu, 1987; Reyes, 1989).

Furthermore, researchers have cited internalizing problems (e.g., depression, social withdrawal, anxiety) as a risk factor increasing likelihood of HSDO (Fortin et al., 2006; Marcotte, Fortin, Royer, Potvin, & Leclerc, 2001). The interaction of person-specific and environmental stressors may strain youth's emotional functioning system (Ingram & Luxton, 2005), creating sufficient conditions for vulnerability. These stressors, combined with a student's biological predisposition to internalizing problems, may exacerbate preexisting vulnerabilities, such as learning disabilities or stress within the family context (Chaplin & Cole, 2005), leading to poor school performance and outcomes, such as HSDO.

Student and family background characteristics. Research suggests that prior to even beginning school, certain background characteristics may make some students more vulnerable to HSDO than others. The student background characteristics most commonly

cited in the HSDO literature include SES and ethnic origin (Alliance for Excellent Education, 2010; Kelly, 2005; U.S. Census Bureau, 2013; U.S. Department of Education, National Center for Educational Statistics, 2000; Valencia, 2005). These background characteristics do not directly influence the likelihood of HSDO but rather indirectly influence students' outcomes through their association with social and contextual conditions that create barriers for underserved populations. Use of pattern-centered approaches helps to explain these differences. For example, although ethnicity is often cited as a risk factor for HSDO, with African American, Latino, and American Indian students having a higher dropout rate than students from other ethnic backgrounds (e.g., Alliance for Excellent Education, 2010; Kelly, 2005; U.S. Census Bureau, 2013; Valencia, 2005), race alone is not the driving factor that leads youth to leave high school early without a diploma (e.g., Wood, Kiperman, Esch, Leroux, & Truscott, 2017). Rather, specific social and contextual difficulties associated with being from a minority background contribute to these observed disparities. The family, school, and community conditions for racial and ethnic minorities in the U.S. are generally much worse than for the white majority. For example, African American and Latino children are three times more likely than Caucasian students to be from low-income families and eight times as likely as whites to attend high-poverty schools, limiting their access to resources, and thus, impeding their likelihood of high school graduation (see review by Rumberger, 2011).

1.7 Summary of Person-specific and Contextual Vulnerabilities for HSDO

Collectively, findings provide evidence that students at-risk for HSDO experience a multitude of diverse person- and context-specific characteristics that, in concert, either

facilitate or create barriers to high school success and completion. The multitude and diversity of risk factors cited in the current literature indicates that HSDO is a complex process and provides evidence that there is no single combination of factors that leads to dropping out of school. Rather, many diverse factors interact, accumulate over time, and via multiple pathways to ultimately lead to school withdrawal (Alexander et al., 2001; Rumberger, 2011; Woods, 1995). Despite this recognition, it is unclear which combinations of peer characteristics, embedded within family, school, and community contexts, are most important for protecting against HSDO for at-risk students.

Understanding the unique set of factors that signal HSDO risk for unique groups of students may help clinicians, school personnel, and parents to identify those who may be at-risk. Further, developing a greater understanding of the unique combination of characteristics that may protect against HSDO and promote high school graduation may help interventionists and researchers design and implement tailored interventions targeting combined person- and context-specific indicators for students with different patterns of HSDO risk.

1.8 Rationale for the Proposed Study

Previously, researchers have sought to understand HSDO by examining student risks at a single point in time and comparing those risks to peers who graduate.

Researchers have estimated the impact of person-specific characteristics (e.g., student background, intrapersonal characteristics) on the likelihood of students dropping out of high school (Balfanz, Herzog, & Mac Iver, 2007; Barrington & Hendricks, 1989; Lee & Burkam, 2003; Rumberger, 1987, 2004; Rumberger & Palardy, 2005). However, this type of research has been critiqued as missing as many as half of the students who are

most likely to drop out, as well as misidentifying students as at risk for HSDO, who actually graduate (Balfanz et al., 2007; Gleason & Dynarski, 2002). Rather than a single event, HSDO has become known as a life course experience in which students experience a long history of difficulties in multiple contexts (e.g., school, family, peers) that over time, leads to disengagement from school and ultimately results in HSDO (Alexander et al., 2001; Bowers, 2010a, 2010b; Entwisle, 1990; Finn, 1989; Rumberger & Palardy, 2005).

Although the life-course perspective is an improvement over a cross-sectional view of HSDO, the vast majority of researchers implementing longitudinal studies examining the progression of HSDO, have assessed only one or two domains of functioning. Person-specific risk factors are assessed most frequently (e.g., academic performance, internalizing and externalizing problems, learning difficulties, social deficits). However, few researchers have explored trajectories of environmental/ecological risk factors, such as trajectories of peer risk, using longitudinal models of change in order to understand how family, school, and community characteristics impact these trajectories.

The proposed study aims to address these gaps in previous research by predicting likelihood of HSDO for high-risk students through (a) testing a model which examines the possibility of different subpopulations of students at-risk for HSDO; (b), defining risk subpopulations by peer characteristics/relationships, a critical and understudied ecological risk; (c) studying longitudinal trajectories of change (i.e., growth or decline in peer risk profiles), and; (d) examining the relationship that contextual support (family, school, and community support) has on group membership to each risk trajectory. Data

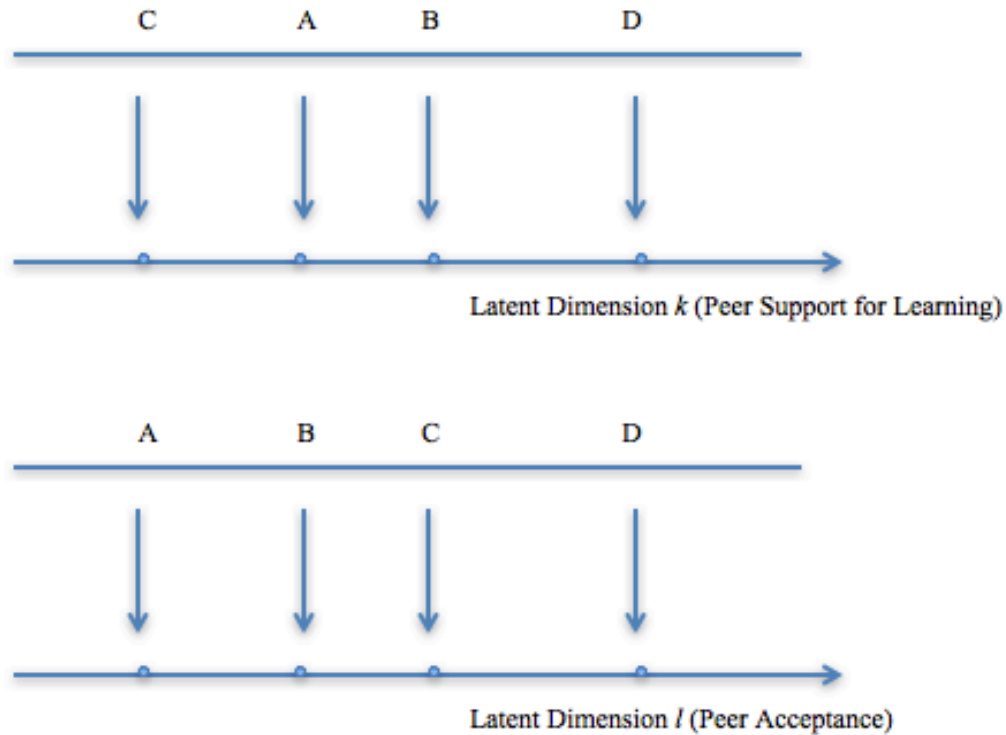
for the proposed study were obtained from the Center for Adolescent Research in Schools (CARS) study, a multi-site randomized controlled trial across fifty high schools in five states, exploring the impact of student- and classroom-level supports on student emotional/behavioral and academic functioning.¹ It fills a gap in the literature by examining the trajectory of peer risk in predicting likelihood of HSDO for subpopulations of high-risk students and examines the relationship that family and school/community support has on group membership to each trajectory.

Because peers are considered among the strongest social reinforcers during the adolescent period of development (Brown, 1990; Brown & Larson, 2009), understanding trajectories of peer risk characteristics will help families and school personnel identify students who may be at risk and develop interventions to help prevent HSDO for similar high-risk populations of students. Understanding how intrapersonal strengths and supports within the family, school, and community contexts relate to group membership in more or less risky peer ecologies will not only provide a more comprehensive understanding of contextual risks associated with HSDO, but will reveal valuable information about protective factors that could change the course for students in high risk trajectories to facilitate positive outcomes, such as graduation. Whereas the current literature contains information regarding risk factors for HSDO across a variety of domains, information about protective factors may be especially useful for researchers

¹ Data of the larger CARS study included a battery of psychosocial assessments of student functioning in school, social, and family contexts, completed by students, parents and teachers across five data points over two years. Parent interviews were also conducted, which examined current and previous experience with services. The procedures and measures described here is limited to the measures used in the current study.

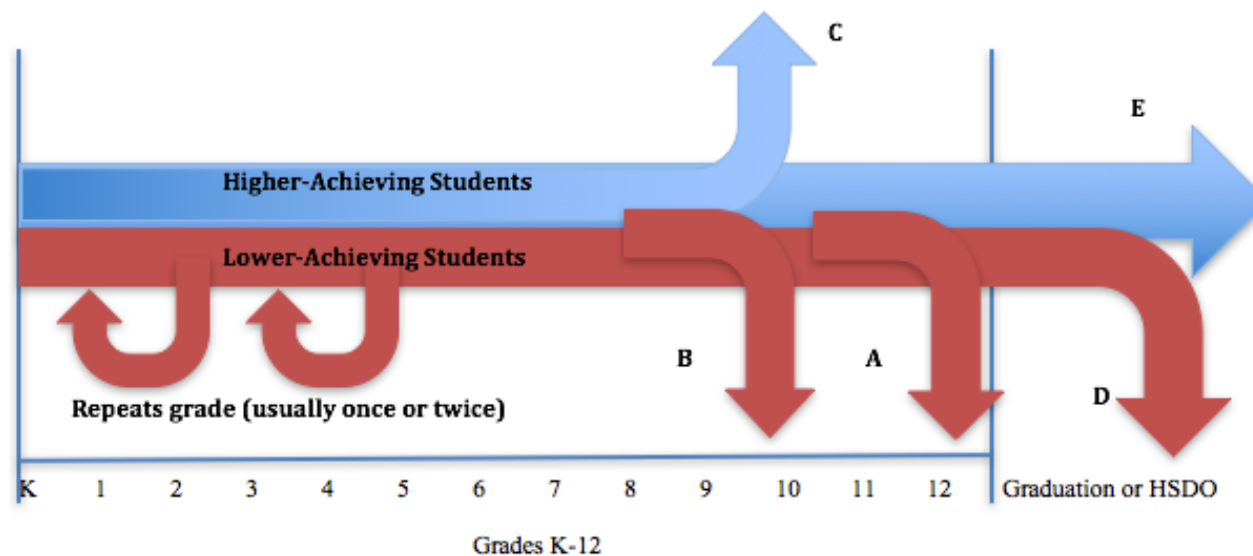
and practitioners to better understand and prevent HSDO for high-risk student populations.

Identifying unique profiles of functioning among students at-risk for HSDO and examining the trajectories of unique profiles of students may provide a more comprehensive and accurate understanding of those at-risk for HSDO. Additionally, knowledge gained from this study may facilitate the development of interventions that addresses unique risks for students. Intervening on factors in a students' family, peer, or school/community contexts may help parents, teachers, and practitioners to identify risks and maladaptive trajectories early in life to improve outcomes for these students.



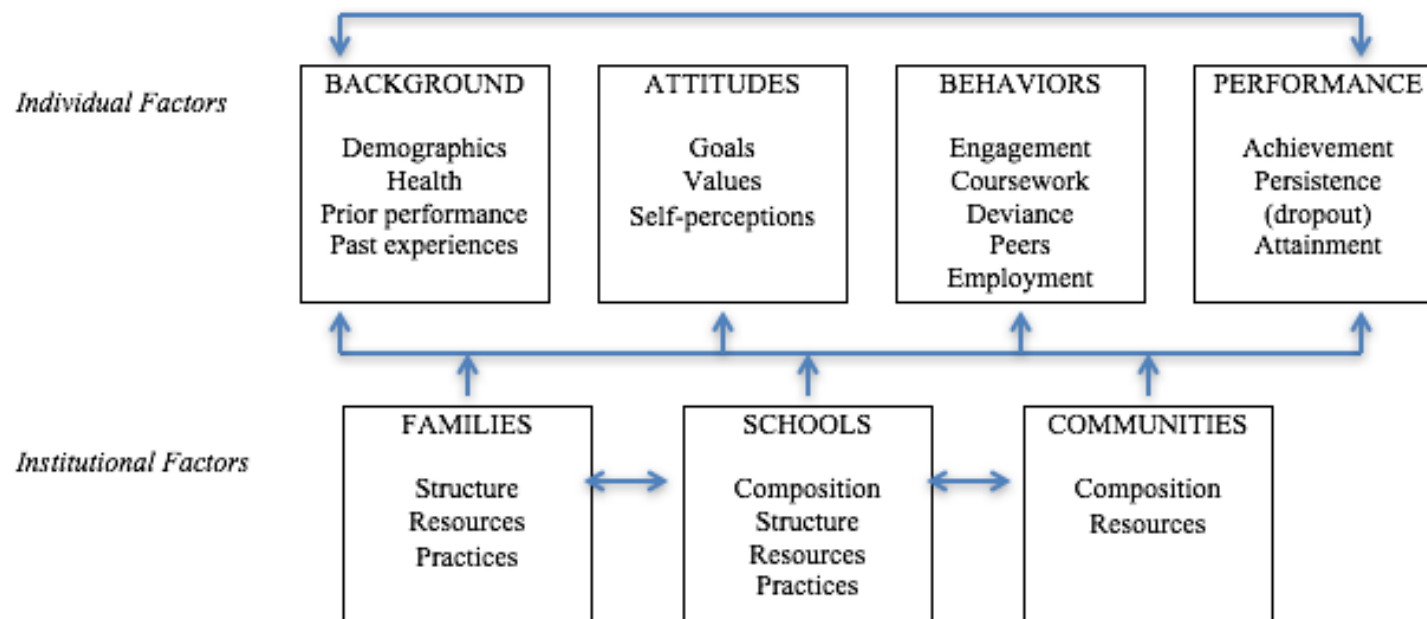
Notes. This figure illustrates a statistical correlation between data for the positions of individuals A, B, C, and D and the latent dimensions k and l . Reprinted from “The Person Approach: Concepts, Measurement Models, and Research Strategy,” by D. Magnusson, 2003, *New Directions for Child and Adolescent Development* (101), pp. 15. Copyright [Fall 2003] by Wiley Periodicals, Inc.

Figure 1.1 *The variable approach measurement model.*



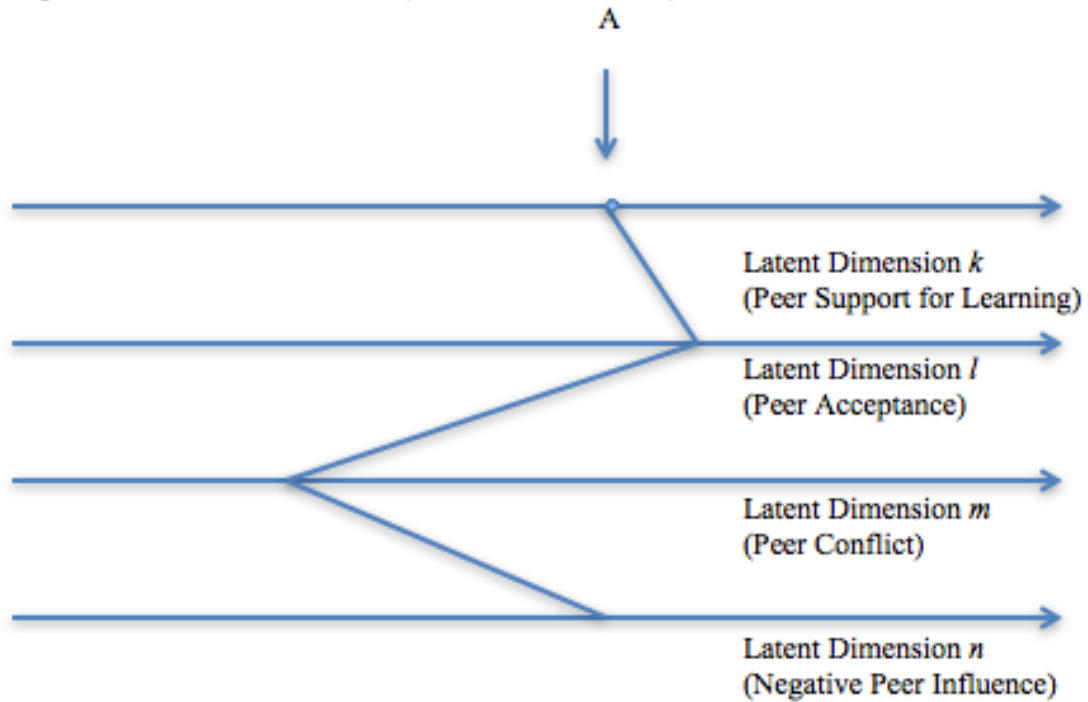
Notes. This figure shows an early conceptualization of High School Dropout (HSDO) typologies. A= Quiet Dropouts (students with low behavior problems, but high academic problems, who quietly disengage from school); B=Pushouts (behavior problems are the result of HSDO); C=Pushouts (behavior problems are the cause of failure); D=In-School Dropouts (students who attend school but put forth minimal effort or fail their final exams); E=Graduates (adequate achievement leading to high school completion). Reprinted from “Dropouts: Who Drops out and Why—And the Recommended Action,” by R. F. Kronick & Charles H. Hargis, 1998, pp. 6. Copyright [1998] by Charles C. Thomas Publisher, LTD.

Figure 1.2. *An early conceptualization of high school dropout.*



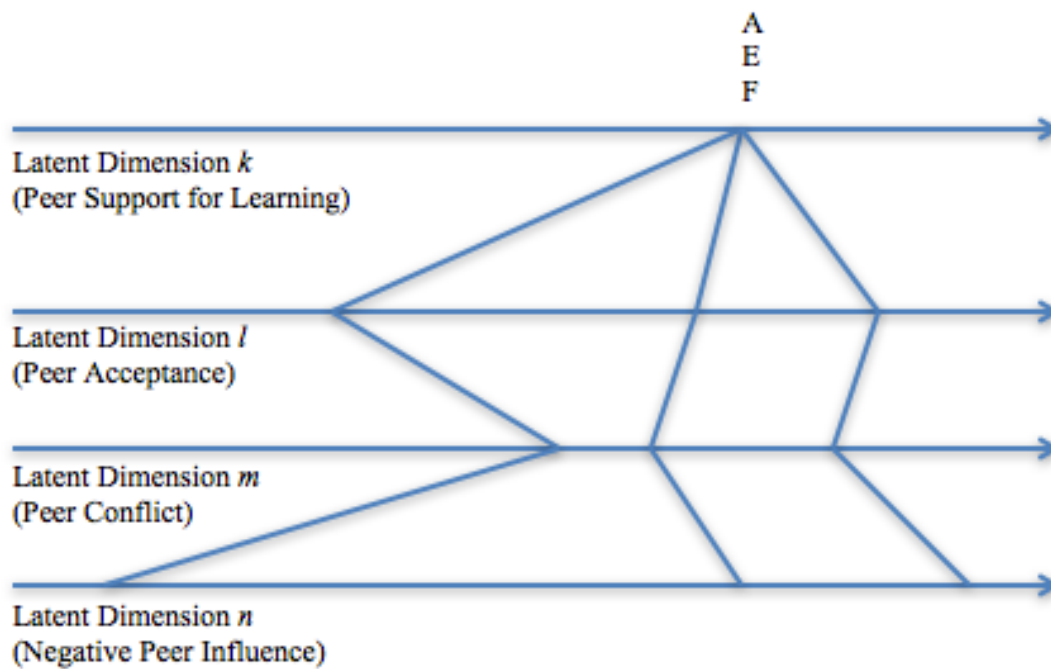
Notes. In this model, school dropout and graduation are understood as specific aspects of student performance, which are influenced by characteristics across two domains: individual factors (i.e., intrinsic characteristics associated with the individual) and institutional factors (i.e., characteristics across family, school, and community contexts). Reprinted from “Why Students Drop Out of School: A Review of 25 Years of Research,” by Russell W. Rumberger and Sun Ah Lim, 2008, http://Cdrp.Ucsb.Edu/Dropouts/Pubs_Reports.Htm#15 (accessed January 21, 2016).

Figure 1.3. *A conceptual model of student performance in high school.*



Notes. This figure illustrates how a single piece of data for individual A on latent dimension k derives its importance based on its position in a pattern of data for the same individual (positions on the latent dimensions k , l , m , and n). Latent dimensions represent components that are simultaneously working together in the system being studied. Reprinted from “The Person Approach: Concepts, Measurement Models, and Research Strategy,” by D. Magnusson, 2003, *New Directions for Child and Adolescent Development* (101), pp. 15. Copyright [Fall 2003] by Wiley Periodicals, Inc.

Figure 1.4. *The Pattern-Centered (i.e., Person-Centered) Measurement Model.*



Notes. This figure shows that the same position for different individuals (e.g., A, E, F) on one latent dimension l may differ completely in its significance in the combined functioning of individuals in the group. Figure 4 illustrates how it is not until factors are examined in combination with simultaneously working other factors that conclusions can be drawn. Adapted from “The Person Approach: Concepts, Measurement Models, and Research Strategy,” by D. Magnusson, 2003, *New Directions for Child and Adolescent Development* (101), p. 15. Copyright [Fall 2003] by Wiley Periodicals, Inc.

Figure 1.5. *Fictitious Profiles for Three Individuals, Based on Four Academic Domains.*

CHAPTER 2

METHOD

2.1 Participants

We As mentioned, data for this study come from a larger, longitudinal study of students at-risk for HSDO (study criteria is included in Appendix A). Data were collected across five time points over the span of two years. Based on completeness of the datasets at each time point, data will be used from three collections that occurred at Time 1 (T1) during the summer of 2011, Time 3 (T3) summer of 2012, and Time 5 (T5) summer of 2013 to examine the progression of peer-risk behaviors predicting HSDO. Data collected at 1-year post-intervention during the summer of 2014, Time 6 (T6), will be used for the HSDO outcome variable. Demographic and descriptive variables collected at T1 are summarized in Table 2.1.

At T1, participants included 647 (64.1%) males in the eighth (6.3%), ninth (44.8%), tenth (42.8%), and eleventh (4.6%) grades,¹ who were enrolled in 50 high schools spanning five states in the Midwestern, Northeastern, and Southeastern regions of the United States. The majority of students identified as White/Caucasian (50.4%), followed by Black/African American (37.6%) and the remaining 9% identified as “other.” According to parent report on general demographic questionnaires, most participants were served through the general education curriculum (53.3%), received free

¹ Missing data are presented in Table 2.1.

or reduced lunch at school (68.9%), and many students lived in households that earned an income of less than \$20,000 per year (35.1%). All participants were identified by school personnel as students with emotional and/or behavioral concerns, who may be at-risk for HSDO (see Appendix A for full study participation criteria). According to school data, most students had received one or more failing grades on their most recent report card ($n=460$, 71.1%), with 35% of students having three or more failing grades ($n=228$). Per parent report, most of the sample had previously been diagnosed with an emotional or behavioral disorder (e.g., Attention-Deficit/Hyperactivity Disorder [46.7%], Depression [27.7%], Anxiety [24.9%], Bipolar Disorder [9.7%], or another mental health problem [7.4%]) and reported that 43.4% of students ($n=271$) were taking psychopharmacological medication to address emotional or behavioral concerns at T1. The overall retention rate of the sample based on 647 participants at T1 was 87% ($N=536$) at T3 and 40% ($N=261$) at T5. Full information maximum-likelihood estimators were used to allow for inclusions of participants with partial missing data.

2.2 The Larger Study

Participants were enrolled in a larger, national research study by the Center for Adolescent Research in Schools (CARS), a five-year study funded by the Department of Education that examined the efficacy of implementing academic, social, emotional, and behavioral interventions to students who were identified as at-risk for HSDO. Using a randomized-controlled trial (RCT) design, CARS implemented and evaluated a consultation model for supporting school personnel through the process of implementing empirically-based interventions to provide support for these students. During years one through three, interventions were developed and piloted and the intervention phase of the

project took place in the final two years of the study (during the 2011-2012 and 2012-2013 school years). Follow-up data was collected in the summer of 2014 to determine assess student outcomes (HSDO or graduation). At T6, the majority of students who enrolled at T1, would have been 18 years or older ($n=497$, 76.8).

During the intervention phase of the project, intensive interventions were provided to participating students in the 25 treatment high schools across multiple levels of support (see Appendix B for details regarding interventions in the larger study). The reliability and integrity of implementation of all interventions was monitored on a weekly basis by trained research staff and feedback and/or booster training sessions were provided to school personnel implementers monthly. Parents and teachers of students in the 25 remaining high schools (i.e., comparison schools) received less intensive interventions and were provided one-page psycho-educational handouts (e.g., strategies for student emotional, behavioral, and academic success) each month for the two-year duration of the intervention phase of the study.

Data used in the current study were obtained from students enrolled in the CARS project across all 25 treatment and 25 control schools assessed at T1, T3, T5, and the T6 follow-up. Since participation in the CARS treatment group may have affected the variables examined in the current study, membership to the treatment group for the larger study was included as a potential covariate. Additionally, participants ranged in age from 13 to 18 years at T1 (see Table 2.1). Because developmental differences among students of different ages may impact the outcome, age was also included as a potential covariate in the analyses. Other covariates considered for inclusion were race, annual household income, free/reduced lunch status (i.e., receipt of free or reduced lunch at school), gender,

failing grades (i.e., receiving an “F” on the most recent report card), internalizing problems, and externalizing problems. Procedures for determining final covariates that were included in the model are described further in the Data Analysis Strategy section below.

2.3 Procedure

During the initial recruitment process, which occurred during the 2010-2011 school year, teachers, administrators, and other school personnel were asked to identify up to 20 students at each of the 50 participating high schools using the inclusion criteria (Appendix A) to guide referrals. School personnel were then directed to contact parents or guardians of identified students to obtain permission for the CARS staff to initiate contact via phone. Students who did not return permission slips within a week were offered a \$5 gift card as an incentive, based upon return of the form, not on whether or not permission was granted. Parents who provided permission were then contacted by CARS staff who scheduled an initial meeting where goals and procedures of the project were described, as well as risks and benefits of participation, including monetary compensation.

Consent and assent was granted from parents and students, including consent for CARS staff to gather school functioning data from the school (e.g., grades, attendance, behavior referrals), as well as information to determine eligibility for participation in the study. Parents, students, and teachers completed measures across T1, T3, and T5.

Additionally, one core teacher¹ (i.e., a teacher who knew the student well) was identified

¹ One core teacher was identified by CARS staff and/or school personnel to complete a larger, more comprehensive battery of measures assessing psychosocial, emotional, behavioral, and academic functioning. Core teachers often included a students’ case manager or special education teacher (for students who received special education services), or a teacher who had taught the student for multiple semesters.

for each student to complete a more comprehensive battery of measures. Assessments included a battery of psychosocial assessments of student functioning in school, social, and family contexts, as well as interviews about previous experience with services. Teachers of students' main academic classes (e.g., math, science, English, social studies) completed a short battery of classroom and school-functioning assessments for each student. Core teachers completed a larger battery of measures that assessed psychosocial, emotional, behavioral, and academic functioning. Parents, students, and teachers completed similar batteries at each of the time points and were given a monetary incentive for every completion (Parents=\$50; Students=\$50; Teachers=\$5; Core Teachers=\$20). School functioning data were collected from the school quarterly over the span of the project.

As stated above, the study involved a multisite RCT, with seven sites in five states (Kansas, Missouri, Ohio, Pennsylvania, and South Carolina), across 50 high schools. Each site was affiliated with a university. Institutional review board approval was obtained at each site from the university and collaborating school districts. The study adhered to all ethical principles of research using human subjects. Prior to data analysis, respondents were assigned numbers only, excluding all identifying information.

Measures

This study had four primary aims: (1) to identify latent peer risk profiles at T1, T3, and T5, (2) to determine trajectories of peer risk profiles across the three time points, (3) to examine whether group membership to any of the peer risk trajectories significantly predict HSDO or graduation at T6, and (4) to assess whether any of the peer risk trajectories identified in Aim 3 as significantly predicting HSDO or graduation, are

predicted by support in family, school, or community contexts (using data collected at T1). Although specific a priori hypotheses could not be specified for Aims 1, 2, and 3, in general, it was expected that the peer risk trajectories would differ in predicting HSDO, with certain combinations of characteristics having a greater likelihood of HSDO than others. It was also expected that some profile patterns would contain both risk and protective factors that may off-set the risks of HSDO. For Aim 4, it was expected that higher support across all three contexts (family, school, and community) would be associated with peer risk trajectories that led to high school graduation; whereas lower support across the three contexts would be associated with trajectories that led to HSDO. Measures used in the current study are described next, followed by a description of each construct examined.

Student Engagement Instrument (SEI; Appleton et al., 2006). The SEI, a 35-item questionnaire designed for use with middle and high school students, examines self-reported engagement from the perspective of the student. Theoretically based on Appleton colleagues' (e.g., Appleton et al., 2006; Christenson et al., 2008) four-part typology of engagement (including academic, behavioral, psychological, and cognitive engagement), the SEI is designed to evaluate the more covert areas of engagement: psychological and cognitive. The SEI measures six subtypes of SE: Teacher-Student Relationships (TSR; nine items), Peer Support for Learning (PSL; six items), Family Support for Learning (FSL; four items), Control and Relevance of School Work (CRSW; nine items), Future Aspirations and Goals (FG; five items), and Extrinsic Motivation (EM; two items). Students are asked to rate the degree to which they agree or disagree on

a four-point Likert rating scale (1 = strongly agree, 2 = agree, 3 = disagree, 4 = strongly agree), with higher scores indicating higher levels of engagement.

Items for the SEI were created or adapted from the results of an extensive literature review and items were refined via focus groups with diverse sample of students (as outlined by Appleton et al., 2006). Multiple studies have examined the psychometric properties of the SEI (e.g., Appleton et al., 2006; Betts, Appleton, Reschly, Christenson, & Huebner, 2010; Carter, Lovelace, Appleton, & Thompson, 2012; Lovelace, Reschly, Appleton, & Lutz, 2012; Spanjers, 2007) and use of the SEI is widespread in districts across the United States (Reschly, Betts, & Appleton, 2012), which suggests there is growing evidence to support the utility of this instrument. Previous research on the SEI has yielded good internal consistency estimates for the *Peer Support* (PSR=.82), *Family Support* (FSL=.76), and *Teacher Support* (TSR=.88) scales and there is support for the validity of scores with a wide range of intended outcomes related to SE (Appleton et al., 2006; Spanjers, Burns, & Wagner, 2008).

Stress Index for Parents of Adolescents (SIPA; Sheras, Abidin, & Konold, 1998). The SIPA is a 112-item questionnaire, designed to assess parenting stress in parents of adolescents. The SIPA was created using factor analysis, as a developmentally sensitive extension of the Parenting Stress Index (PSI; Abidin, 1995), and includes items more specific to parents of adolescents. The SIPA yields scores on five domains of parenting stress: Adolescent Domain, Parent Domain, Adolescent-Parent Domain, Life Stress Scale, and Total Parenting Stress. The first 90 items on the SIPA are rated on a 5-point Likert rating scale (1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, and 5 = strongly agree), with higher scores indicating higher levels of stress. The last 22 items

ask parents to indicate whether (yes/no) any of the listed stressful life events (e.g., divorce, moving to a new home, loss of job) occurred in their family over the past 12 months. Previous research on the SIPA has yielded good internal consistency ($\alpha = .81-.93$) and test-retest estimates ($\alpha = .81-.97$; Sheras et al., 1998).

Youth Risk Behavior Survey (YRBS; Centers for Disease Control and Prevention [CDC], 2004). The YRBS is a questionnaire designed to monitor health risk behaviors that contribute to death, disability, and social problems among adolescents and adults in the United States, such as sexual behaviors, alcohol and drug use, and behaviors that contribute to unintentional injuries and violence. Originally developed in 1990, the YRBS is used in a national study that is conducted every odd year by the CDC (2004). The YRBS is administered to samples collected at the national, state, and local levels. Before the administration of each biennial survey, sites (states and districts) and the CDC work together to revise the questionnaire to reflect specific site and national initiatives (Centers for Disease Control and Prevention, 2004). The YRBS is self-administered in private and public high schools. For each item, students are asked to indicate one response out of eight mutually-exclusive response options that best describes their own behavior. The YRBS has shown good test-retest reliability ($\kappa = 61\%-100\%$) with no statistically significant differences observed between the prevalence estimates for the first and second times the measure was administered (Brenner, Collins, Kann, Warren, & Williams, 1995). The responses of students in grade seven were less consistent than those in higher grades, indicating the questionnaire is best suited for students in grades eight and above (Brenner et al., 1995). No study has been conducted to assess the validity of all self-reported behaviors included on the YRBS questionnaire.

Services for Children and Adolescents-Parent Interview (SCAPI; Jensen, Eaton Hoagwood, Roper, Arnold, Odbert, Crowe, . . . Wells, 2004). The SCAPI is a highly structured measure designed to assess use of services across primary care, specialty mental health, and other settings, as well as service type, intensity, onset and offset, provider type, and content. The measure is given in interview format, and item format varies throughout the questionnaire. In the first section, parents are asked to name each medication their adolescent is currently taking for attention, learning, or behavior and answer a series of questions about medication use (17 items for each medication). The next few sections of the questionnaire ask parents to report their adolescent's history of services across several contexts: inpatient/overnight services (8 items), outpatient services (10 items), school-based services (8 items), after school, weekend or summer programs (3 items), and other community services (5 items). Finally, parents are asked to respond yes or no to a series of items that assess family history of mental health services (5 items).

Previous research on the SCAPI has yielded good test-retest estimates, with κ values ranging from .49 to 1.0, with an overall κ value for all services of .97 (Hoagwood, Jensen, Arnold, Roper, Severe, Odbert, . . . Molina; 2004). Notably, 7 out of 10 service types had κ values of .75 or higher, indicating excellent reliability. Meaningful, face-valid differences between control and treatment children in all levels and types of services across a 6-month period was reported through the measure development study (Jensen et al., 2004), which suggests the SCAPI has good face validity. Further, data obtained from parent report on the SCAPI was consistent with data independently gathered by the research data center, suggesting good convergent validity.

Alabama Parenting Questionnaire (APQ; Shelton, Frick, & Wootton, 1996).

The APQ, parent version, a 42-item measure, is designed to assess parenting practices often regarded as correlates to problem behaviors in children and adolescents. When used with adolescent populations, APQ yields scores on four domains: Positive and Involved Parenting (17 items), Poor Monitoring (10 items), Inconsistent Discipline (6 items), and Corporal Punishment (3 items; Zlomke, Lamport, Bauman, Garland, & Talbot, 2014). Seven additional items assess discipline practices other than corporal punishment, which are included to decrease likelihood of negative biases of respondents toward the corporal punishment items (Shelton et al., 1996). Parents are asked to rate the “typical” frequency of their (or their child’s) behavior for a series of statements such as “You have a friendly talk with your child” and “Your child fails to leave a note or to let you know where he/she is going” on a 5-point Likert rating scale (1=never; 2=almost never; 3=sometimes; 4=often; 5=always). Psychometric studies of the APQ have demonstrated appropriate to good reliability of the four scales when used with adolescent populations ($r = .66 - .86$; Zlomke et al., 2014).

Behavior Assessment System for Children – Second Edition, Parent Report Scale (BASC-2-PRS; Reynolds & Kamphaus, 2004). The BASC-2-PRS is a well-established measure used to evaluate the adaptive skills and problem behavior of youth. Composite scores on Internalizing Problems (40 items) reflect symptoms of anxiety, depression, and somatization, and Externalizing Problems (30 items) reflect symptoms of aggression, conduct problems, and hyperactivity. Parents are provided a series of statements and are asked to rate how frequently their adolescent behaved recently (in the last several months) on a 4-point Likert scale (1=never; 2=sometimes; 3=often;

4=always). Standardized T-scores are provided, which reflect how a student performed in relation to a norm-based sample of peers of the same age. Higher scores signify more severe problems, with scores between 60 and 69 indicating risk and scores 70 or above being considered clinically significant.

Indicators for the Present Study

As described above, the current study (1) identified unique profiles of peer risk for students at T1, T3, and T5, (2) examined peer risk trajectories of students across time points, (3) assessed whether group membership to a specific trajectory pattern predicted high school graduation or HSDO at T6, and (4) examined the predictive relationship among contextual support (family, school, and community; assessed at T1) and group membership to any of the peer risk trajectories identified in the third step. The four indicators used to identify unique profiles of peer risk are presented first, followed by the outcome variable (HSDO or graduation); next, the three contextual support indicators are described; finally, the covariates considered for inclusion in the study are presented.

Peer risk profile variables. Four peer risk indicators were used in Aim 1 and Aim 2 to identify the peer risk profiles at T1, T3, and T5, and to examine their trajectories over time. The indicators included in the current study were as follows: Peer Support for Learning (6 items), Peer Rejection (4 items), Peer Conflict (1 item), and Negative Peer Influence (1 item). Each indicator was included separately in the model to examine unique patterns of peer risk for unobserved sub-populations of students. Items from each scale were transformed to create standardized scores (i.e., the possible range of responses was congruent across each item), which is further described below.

Peer Support for Learning. This indicator was measured by the peer support for learning (PSL) subscale of the SEI (Appleton et al., 2006), which includes six items assessing students' perceptions of peer support in the school environment. Students were asked to rate the degree to which they agree or disagree with items such as "Other students at my school care about me" and "Other students at my school are there for me when I need them." Items were rated on a four-point Likert scale 1 = strongly agree to 4 = strongly disagree). In order to standardize the scores so they were on a consistent scale as other indicators, a midpoint was added to create a 5-point scale (so that 1=0, 2=1, 3=3, and 4=4), with higher scores signifying higher levels of peer risk. The mean (average) was taken across items at each time point to use in the analyses: T1 ($M=1.27$, $SD=.95$), T3 ($M=1.33$, $SD=.96$), T5 ($M=1.24$, $SD=.9$)¹. The Peer Support scale showed good internal consistency across the three time points (T1 $\alpha=.85$, T3 $\alpha=.84$, T5 $\alpha=.87$).

Peer Rejection. Peer Rejection was measured by parents' ratings across four items of the SIPA (Sheras et al., 1998). On the SIPA, parents are asked to indicate the degree to which they agree or disagree with statements that assess the quantity and quality of their child's relationships with peers. Parents' perceptions of their adolescent's peer relationships, specifically focusing on peer acceptance, are assessed by four items such as "My child has no close friends" and "my child is frequently bossed around or bullied by others." Items were rated on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree), with higher scores signifying higher levels of peer risk. The mean (average) was taken across items at each time point to use in the analyses: T1 ($M=1.16$,

¹ Missing data are reported in Table 2.1.

$SD=.89$), T3 ($M=1.07$, $SD=.89$), T5 ($M=.99$, $SD=.86$)¹. The Peer Rejection scale showed good internal consistency across the three time points (T1 $\alpha=.76$, T3 $\alpha=.77$, T5 $\alpha=.77$).

Peer Conflict. The Peer Conflict indicator was measured by students' ratings on a single item of the YRBS: "During the past 12 months, how many times were you in a physical fight?" (answer choices: 0, 1, 2-3, 4-5, 6-7, 8-9, 10-11, or 12 or more fights). Scores were transformed to a five-point scale (0=0, 1=1, 2=2, 3=3, and 4=4 or more fights; T1 $M=1.09$, $SD=1.22$; T2 $M=.76$, $SD=1.1$; T3 $M=0.65$, $SD=1.0$)¹ for scale consistency with the other indicators, with higher scores indicating a higher level of conflict.

Negative Peer Influence. Negative Peer Influence was measured by a single item on the SIPA (Sheras et al., 1998). Parents were asked to rate the degree to which they agree or disagree with the statement: "My child often gets in trouble when he or she is with his or her friends" on a five-point Likert scale, with higher scores signifying higher levels of negative peer influence (T1 $M=1.59$, $SD=1.3$; T3 $M=1.49$, $SD=1.24$; T5 $M=1.2$, $SD=1.17$)¹. The reported score on this item was used to represent level of negative peer influence.

High school dropout status (HSDO). A single dichotomous variable, collected at T6 of the larger study was used to indicate whether a student graduated from high school or dropped out of high school. HSDO was defined as any student who withdrew from school before earning a degree or certificate) during the course of the study (summer of 2011-summer 2014), whereas high school graduation was defined as any student who was still enrolled in the study at T6 (summer of 2014). High school

¹ Missing data are reported in Table 2.1.

graduation was coded as “1” and HSDO was coded as “0.” The HSDO variable was used as the outcome variable in Aim 3 of the proposed study to examine effects of peer risk trajectories on HSDO. Descriptive data showed that about half of the sample was identified as dropping out of high school at T6 ($n=329$, 50.9%).

Contextual Support. In the present study, the following indicators were used to assess support across three contexts: Family Support, School Support, and Community Support. These three indicators were included separately in the analyses. The items used to assess support across each context are described next.

Family Support. Family Support was assessed with 48 items adapted from the SEI (Appleton et al., 2006), APQ (Shelton et al., 1996), SIPA (Sheras et al., 1988) and SCAPI (Jensen et al., 2004) collected during T1 of the larger study. Four items of the SEI assessed family support for learning, as reported by the student. Seventeen items of the APQ assessed parent-reported involvement, 22 items assessed stress within the family, as reported by the parent, and five items assessed parent reported access to family rehabilitation services. In order to summarize a large set of factors related to family support without sacrificing degrees of freedom (Ackerman, Izard, Schoff, Youngstrom, & Kogos, 1999), multiple risk scores were calculated, following the method described by Sameroff, Seifer, Baldwin, & Baldwin (1993). First, the continuum of scores on each area of support was dichotomized into two groups representing the presence or absence of risk. Then, the resultant scores were totaled to create one summed score, signifying Family Support. This method is described in more detail below.

Family support for learning. On four items of the SEI (Appleton et al., 2006), students were asked to rate the degree to which they agreed or disagreed statements such

as, “My family/guardians are there for me when I need them” and “When I have problems at school my family/guardians are willing to help me.” Items were rated on a four-point Likert scale, with lower scores signifying better family support. Scores were transformed so that lower ratings indicated better family support (0=0, 1=0) and higher ratings indicated poorer family support (2=1, and 3=1).

Parent involvement. Seventeen items of the APQ (Shelton et al., 1996) were used to assess parent-reported involvement in their adolescent’s school activities. Parents were asked to rate their frequency of behavior for statements such as, “How often do you volunteer to help with special activities that your child is involved in (such as sports, boy/girl scouts, church, youth group)?” and “How often do you help your child with his or her homework?” Items were rated on a five-point Likert scale. Items were then reverse scored and transformed so that lower scores indicated better functioning (5=0, 4=0, 3=0.5, 2=1, 1=1).

Family stress. Twenty-two items of the SIPA (Sheras et al., 1998) were used to measure potential stressful family events. Parents were asked to indicate whether or not (yes/no) any of the events had occurred in their immediate family over the past 12-months such as “Divorce/separation?” “Marital reconciliation?” “Other relatives moved into the household?” or “Pregnancy?” Items to which parents answered “yes” were scored as “1” and items to which parents answered “no” were scored as “0,” such that lower scores indicated better functioning.

Access to rehabilitation services. Family use of rehabilitation services was measured by parent-report of five items of the SCAP (Jensen et al., 2004). Parents were asked to respond (Yes/No) to items assessing family use of rehabilitation services, such

as “Have you/your partner ever received any other services (e.g., counseling, in home support) to help manage your child’s behavior?” and “have you/your partner ever attended counseling for your own or marital difficulties?” Items to which parents answered “yes” were scored as “0” and items to which parents answered “no” were scored as “1,” such that lower scores indicated more access to family rehabilitation services. As described above, multiple risk scores were created by totaling scores across 48 items of the SEI (Appleton et al., 2006), APQ (Shelton et al., 1996), SIPA (Sheras et al., 1988) and SCAPI (Jensen et al., 2004) to create a single variable signifying Family Support ($M=18.06$, $SD=4.5$)¹.

School Support. The School Support construct was composed of eight student-reported items from the SEI (Appleton et al., 2006), collected during T1 of the larger study. Students were asked to rate the degree to which they agree or disagree with items such as “Overall, adults at my school treat students fairly” and “My teachers are there for me when I need them.” Items were rated on a four-point Likert scale (1 = strongly agree to 4 = strongly disagree). Item ratings were reverse-scored and recoded, such that lower scores signify more favorable perceptions of school support (1=0, 2=1, 3=3, and 4=4). The mean score (average) was taken across items to use in the analyses ($M=2.54$, $SD=.73$)¹. The School Support scale showed good internal consistency ($\alpha=.81$).

Community Support. Community Support was assessed by 19 parent-reported items from the SCAPI (Jensen et al., 2004) that were collected during T1 of the larger study. First, parents were asked to indicate whether or not their child had ever stayed overnight somewhere because of attentional, learning, emotional, or behavioral

¹ Missing data are reported in Table 2.1.

difficulties, substance abuse or other similar difficulty, or if their child had been removed from the home overnight for any reason (voluntary or involuntary placement) in any of the following settings: “hospital,” “substance treatment/rehabilitation facility,” “residential (overnight) treatment for emotional/behavior problems,” “group or foster home,” “detention center or jail,” “emergency shelter,” “other,” and “duplicate” of any of the above. Next, parents were asked to indicate whether or not (yes/no) their child had previously received outpatient services (not overnight) for learning, emotional, behavioral difficulties, or substance abuse in any of the following settings: “community mental health, outpatient/ambulatory clinic,” “psychologist, psychiatrist, or social worker,” “day hospitalization or day treatment,” “substance use rehabilitation,” “therapist/case worker that comes to your home,” pediatrician or family doctor,” “self-help group,” “spiritual or religious leader,” “probation/corrections officer or court counselor,” or “other.”

Consistent with the method used to calculate Family Support (described above) the same method was used to calculate multiple risk scores (Sameroff et al., 1993) for the community support variable. Each activity, program, or service endorsed by the parent was scored “0” and items that were not endorsed by the parent were scored “1.” Ratings were then summed (totaled) across items to create a single multiple risk score, such that lower scores indicated more access to community resources ($M=1.5$, $SD=.84$)¹.

Demographics and other descriptive variables. At T1, parents provided general demographic information (e.g., gender, age, race) at T1, including information regarding receipt of special education services during any point of the student’s educational history,

¹ Missing data are reported in Table 2.1.

diagnosis of previous emotional/behavioral disorder, annual household income, and free/reduced lunch status (i.e., whether or not their adolescent received free/reduced lunch at school). In the current study, this information was used to provide descriptive information for the sample. Student background variables that were expected to have an impact on the outcomes including Age, Race, Free/reduced Lunch Status, Gender, and Annual Household Income were considered for inclusion as covariates in the model.

As mentioned above, schools were randomly assigned to the treatment group or the control group. A dichotomous variable depicting treatment group membership was created and also considered for use as a potential covariate in the model, in order to control for effects that the intervention in the larger study may have had on the outcome variables. Finally, as the purpose of this study was to examine how contextual support influences peer risk HSDO trajectories, intrapersonal indicators most frequently cited in the HSDO literature were also considered for inclusion as covariates in the model. The observed constructs of Failing Grades, Internalizing Problems, and Externalizing Problems are described next.

Failing Grades. School functioning data (i.e., data collected from school personnel) was used to assess failing grades. Quarterly data was provided by schools, reflecting the letter grades the student received at each grading period. Data was used from the initial assessment, T1, which reflected school outcome data during the two most recent semesters (Winter 2010 and Spring 2011). Failing grades was measured by the total number of “F’s” (i.e., total grades that average < 70%) during the two most recent

grading periods (0=no “F’s,” 1=one “F,” 2=two “F’s,” and 3=three or more “F’s”), with higher scores indicating a higher number of failing grades ($M=1.57$, $SD=1.24$)¹.

Externalizing Problems. Externalizing Problems was measured by the externalizing problems composite score on the Behavior Assessment Rating Scale, Second Edition (BASC-2; Reynolds & Kamphaus, 2004; 30 items), which reflects parent-reported symptoms of aggression, conduct problems, and hyperactivity. As recommended, standardized T-scores were used in the analyses, which reflects how a student performed in relation to a norm-based sample of peers of the same age. Higher scores signify more severe externalizing problems ($M=66.15$, $SD=14.0$).

Internalizing Problems. Internalizing Problems was measured by the Internalizing Problems composite score on the BASC-2 (Reynolds & Kamphaus, 2004; 40 items), which reflects parent-reported symptoms of anxiety, depression, and somatization. Standardized T-scores were used, which reflects how a student performed in relation to a norm-based sample of same age peers. Higher scores signify more severe internalizing problems ($M=61.34$, $SD=13.8$)¹.

2.4 Data Analysis Strategy

The study was guided by four primary aims including (1) to identify latent profiles of 647 adolescents based on patterns of four peer risk indicators for high school dropout (i.e., Peer Support for Learning, Peer Rejection, Peer Conflict, and Negative Peer Influence), (2) to assess the development of these peer risk profiles over time (i.e., across T1, T3, and T5), (3) to examine the likelihood of HSDO based on group membership to

¹ Missing data is reported in Table 2.1.

the identified peer risk trajectories, and (4) to examine whether group membership to any of the identified HSDO peer risk trajectories are predicted by support in three contexts: family, school, and community. Findings from this study may aid in the development of risk assessment tools that school personnel can use to identify adolescents early who may have an elevated risk of HSDO. Additionally, findings from this study may have important practice and policy implications, by contributing to the development of interventions and policies that focus on improving aspects of family, school, and community support systems to support positive peer trajectories and improve likelihood of high school graduation.

To examine Aim 1, distinct patterns of peer risk characteristics at the three time points (T1, T3, and T5) were identified using Latent Profile Analysis (LPA) in Mplus Version 7.4 (Muthen & Muthen, 2015). For Aim 2, trajectory patterns were assessed by hand and assigned dummy codes in SPSS Version 24 (2015). Finally, Binary Logistic Regression (logistic regression) in SPSS Version 24 (2015) was used to examine Aim 3 (i.e., the likelihood of HSDO based on group membership to each identified peer risk trajectory over time) and Aim 4 (i.e., the relationship among three areas of contextual support (assessed at T1) to group membership to any peer risk trajectories that were significantly associated with the HSDO outcome (as identified in Aim 2).

Latent Profile Analysis (Aim 1). LPA analyses were used to assess Aim 1, which was to identify profiles of adolescents based on their patterns of peer risk in four areas: peer support for learning, peer rejection, peer conflict, and negative peer influence. This approach allows researchers to identify groups of individuals who are similar to each other but different from people in other groups (Magidson & Vermunt,

2002; Muthen & Muthen, 2007). The emphasis of LPA is on grouping individuals with similar characteristics, rather than describing relationships among variables (i.e., the variable centered approach). Conceptually, LPA is similar to cluster analysis, which groups individuals based on observed responses by maximizing the differences between clusters and minimizing differences of individuals within clusters. LPA has several advantages over cluster analyses, including that it is a model-based technique that classifies individuals on likelihoods. A probability is provided for each individual in each group.

In exploratory LPA, the number of latent groups is not known a priori. In this procedure, researchers compare models with increasing numbers of latent groups to find the best fit. The complete model is run repeatedly, each time increasing the number of latent classes by one, in order to evaluate whether the addition of each class improves model fit. A two-class solution is examined first, then one class is added at a time to the model until it was clear that the model fit no longer improves. No single criterion exists to determine the best solution. Instead, models are compared based on interpretability, theory, and statistical criteria (Marsh, Ludtke, Trautwein, & Morin, 2009; Pastor & Gagne, 2013). The optimal solution adequately accounts for the complexity of the data using the fewest latent groups (DiStefano & Kamphaus, 2006; Samuelsen & Raczynski, 2013).

To identify distinct profiles among these characteristics, and to clarify the number of latent classes fitting the data best, LPAs were conducted at each time point (T1, T3, and T5). Multiple fit statistics were used to determine which of the models provided the best fit, following steps recommended for comparing competing models (Collins &

Lanza, 2010; Nylund, Asparouhov, & Muthen, 2007). The fit indices examined were Akaike information criterion (AIC), Bayesian information criterion (BIC), adjusted BIC (aBIC), Lo-Mendell-Rubin test, and the bootstrapped likelihood ratio test (BLRT). Lower AIB, BIC, and aBIC values typically indicate better model-data fit. The LMR and BLRT test the null hypothesis that the k -profile solution fits better than a solution with $k-1$ profiles (where k is the number of classes in the model). Significant LMR and BLRT signifies improved model fit. Entropy values were also examined to determine whether the latent classes were distinct from one another. Entropy values approaching 1 were expected to be increasingly indicative of clear classification of individuals within each latent class (Ramaswamy, Desarbo, Reibstein, & Robinson, 1993). Full information maximum-likelihood estimators were used to allow for inclusions of participants with partial missing data, assuming that data were missing at random. In this method, missing values are not replaced or imputed, but handled within the model by using all available information to estimate the model (Ram & Grimm, 2009).

The final model selected was determined by considering statistical fit information, as well as consistency with previous literature. After selecting the best-fitting latent profile model to interpret, the means of the profiles were reviewed. A descriptive name was assigned for each pattern of peer risk at each of the time points to aid in interpretation. To gain a better understanding of the profiles, demographic information was also examined for each of the latent profiles.

Investigations of peer risk trajectories (Aim 2). After identifying the number of latent classes fitting the data best at T1, T3, and T5, participants were assigned dummy-codes to signify group membership to a specific profile pattern at each of the three time

points (e.g., if T1=positive peers, then 1). Cross tabulation analyses were used to assess all potential trajectories across the three time points. Adjusted Residuals were reviewed to examine the likelihood of falling into various profile patterns across the three time points.

To examine the extent to which students transitioned between latent profiles from T1 to T3 to T5, based on their patterns of latent factor scores, a mover-stayer latent transition model was estimated. That is, respondents were classified as “movers” (i.e., discontinuous patterns) if they likely transitioned between profiles across time points or “stayers” (i.e., continuous patterns) for those who remained in a generally consistent profile pattern over time. Respondents exhibiting discontinuous patterns of movement were further examined and described qualitatively as changing from positive to negative or negative to positive.

The mover-stayer model was then used to group each student’s unique pattern of movement with similar trajectory patterns. Code was created to map similar patterns of movement across the time points (e.g., if T1=1, T3=1, T5=1, then 1; if T1=1, T3=1, T5=2, then 2, and so on). This resulted in a new “trajectory group” variable, signifying a student’s membership to a specific pattern of movement. Overall peer risk scores (i.e., sum of scores across the four areas of peer risk) were computed for the new peer risk trajectory group variable, group trajectories were plotted, and reviewed for their theoretical sensibility and distinctiveness. Descriptive names were assigned for each trajectory group to aid in interpretation. Finally, peer risk trajectory patterns were visually inspected by the author and classified each pattern as “high” or “low” risk for HDO,

based on the specific profiles that emerged and how they corresponded to previous literature.

After identifying every possible trajectory pattern, Cross Tabulations and Analysis of Variance (ANOVA) in SPSS Version 24 (2015) were used to assess demographic information collected at T1 (e.g., age, gender, race, free/reduced lunch status, annual household income) and other characteristics associated with HSDO (e.g., recent failing grades, internalizing problems, externalizing problems, family support, school support, community support) to gain a better understanding of the peer risk trajectories and assess possible group differences.

Descriptive analyses (e.g., means, standard deviations) were then computed for demographic/background characteristics (i.e., age, gender, race, free/reduced lunch status, annual household income), internalizing problems, externalizing problems, failing grades, and the contextual support variables (family, school, and community support) across each of the trajectory groups to gain a better understanding of the sample. Additionally, a series of tests were used to examine potential group differences between the trajectory groups (e.g., Analysis of Covariance [ANCOVA], Logistic Regression, Chi Square) for each of the factors listed above.

Peer risk trajectories associated with HSDO (Aim 3). Binary Logistic Regression (logistic regression), using SPSS Version 24 (2015), was employed to examine the likelihood of HSDO based on group membership to specific profile patterns over time (i.e., a student's membership to a profile pattern across T1, T3, and T5). Prior to running the regression, variables that may impact the outcome were assessed and

considered for inclusion in the model as potential covariates. Potential covariates considered included: treatment condition, race, free/reduced lunch status, age, failing grades, annual household income, internalizing problems, and externalizing problems. Bivariate correlations, Chi Square Tests of Homogeneity, and logistic regression (in SPSS Version 24, 2015) were used to assess the relationship among the potential covariates and other independent variables, as well as the relationship among the potential covariates and outcome. Covariates that were observed to be significantly related to the outcome and unrelated to the other IVs were included in the model as covariates. Next, the assumptions of regression were examined (e.g., independence of observations, mutually exclusive categories, absence of significant outliers, high leverage points, or highly influential points) and addressed, as necessary.

Once all assumptions of regression had been met, the model was run, including HSDO as the dependent variable and trajectory group membership, along with any identified covariates, as the independent variables. Standardized regression coefficients, Wald significance levels, Percentage of Accuracy in Classification values, and Predicted Value Percentages were examined to determine which profile patterns, across T1, T3, and T5 (A) have the greatest (or least) likelihood of HSDO and (B) contain risk and/or potential protective factors that may increase (or off-set) risks of HSDO.

Contextual support associated with trajectory groups (Aim 4). Finally, logistic regression was used to examine the likelihood of membership to each trajectory pattern significantly predicting HSDO (as identified in Aim 3), as predicted by three contextual support constructs (i.e., family, school, and community support), collected at T1. Prior to running the regression, the same steps utilized in Aim 3 were repeated to

examine potential covariates to include in the model and to assess the assumptions of regression (e.g., linear relationship among the outcome and independent variables, multivariate normality, absence of multicollinearity, homoscedasticity).

After determining covariates for inclusion and meeting all assumptions, the logistic regression model was employed. The model included group membership to each HSDO trajectory pattern as the dependent variable. Independent variables included Family Support, School Support, Community Support, and any covariates identified as significantly influencing the outcome. Standardized regression coefficients, Wald significance levels, Percentage of Accuracy in Classification values, and Predicted Value Percentages were examined to determine whether any of the three areas of contextual support significantly predicted group membership to any of the HSDO trajectory patterns.

Table 2.1 *Sample distribution among demographic and descriptive variables (N=647).*

	<i>n</i>	%
<i>Gender</i>		
Male	415	64.1
Female	212	32.2
<i>Age</i>		
13-14	150	23.2
15-16	423	65.4
17-18	74	11.4
<i>Grade</i>	--	--
8	41	6.3
9	290	44.8
10	277	42.8
11	30	4.6
Missing	9	1.4
<i>Treatment Condition</i>	214	33.1
<i>Race</i>		
Caucasian	326	50.4
African American	243	37.6
Other	58	9.0
<i>Lunch Status*</i>		
Free/Reduced	446	68.9
Regular	178	27.5
Missing	23	0.2
<i>Annual Household Income**</i>		
\$0 to \$20,000	227	35.1
\$20,001 to \$40,000	200	30.9
\$40,001 to \$60,000	95	15.4
\$60,001 and higher	95	15.4
<i>Mental Health Diagnoses**</i>	--	--
ADHD/ADD	302	46.7
Bipolar Disorder	63	9.7
Depression	179	27.7
Anxiety	161	25.9
Other Mental Health Problem	48	7.4
<i>Failing Grades***</i>		
0 Failing Grades	184	28.4
1+ Failing Grade	135	20.9
2 Failing Grades	97	15.0
3+ Failing Grades	228	35.2
Missing	3	0.5
<i>High School Dropout</i>	329	50.9

Notes. Treatment Condition indicates treatment condition of larger study. *Indicates parent report of free/reduced lunch at school. **Reported by parent or legal guardian.

CHAPTER 3

RESULTS

This study expands the HSDO literature by reconsidering the single homogenous HSDO category as heterogeneous and estimating the associated influence of contextual support in the family, school, and community on the likelihood of membership to different subgroups (i.e., trajectory patterns). It was hypothesized that rather than a single, homogenous group, different subtypes of students who dropout of high school exist, and that these subgroups can be identified using peer risk trajectory patterns that either increase or decrease likelihood of HSDO. Additionally, it was predicted that support within the family, school, and community contexts impacts students' likelihood of belonging to various trajectory patterns that lead to HSDO.

Results from the Latent Profile Analyses (LPAs) completed at T1, T3, and T5 (used to examine Aim 1) are presented first (Tables 3.3-3.4 and Figures 3.1-3.3). Students' trajectories across time points are described next (Aim 2) and can be found in Table 3.5 and Figure 3.4. Descriptive statistics for the trajectory groups and correlations for main study variables are displayed in Tables 3.5-3.6. Finally, the results of the regression models (used to examine Aims 3 and 4) are presented (Tables 3.7-3.8).

3.1 Latent Profile Analysis (Aim 1)

First, a total of six latent profile models of peer risk were estimated at T1, five models were estimated at T3, and five models were estimated at T5. Estimations were

discontinued at the six-class model (for T1) and five-class models for T3 and T5 because those solutions included at least one very small class that had no practical significance. The model fit summaries for the latent profile solutions that were considered for selection at each time point are presented in Table 3.3. Of the models considered, a four-profile solution (at T1), three-profile solution (T3), and two-profile solution (T5) were selected for interpretation for reasons of parsimony and because they had the best statistical fit summary (e.g., log likelihood H_0 value, BIC value, entropy estimate) and were most conceptually consistent with previous literature.

Standardized means for the peer variables included in the LPAs at each time point are displayed in Table 3.4 and Figures 3.1-3.3. As mentioned above, at T1, the best fitting model was the four-profile solution. As seen in Figure 3.4, one of the profiles is characterized by relatively low levels of peer risk across domains. For the ease of presentation, this group of students is referred to as the (T1-I) *positive peers group* ($n=327$, 51.3%); however, the reader should be aware that a brief one- or two-word label does not capture the full complexity of the entire positive peers profile. In Contrast to the positive peers group, the second risk profile, the (T1-II) *negative peers group* ($n=46$, 7.2%), is characterized by generally high levels of peer risk across domains. The (T1-III) *unsupported peers group* ($n=69$, 10.9%) is distinguished by low risk of peer conflict and negative peer influence, but moderate levels of rejection and low peer support. Finally, the (T1-IV) *bullies group* (195, 30.6%) is identifiable by low risk of peer support and rejection, but high risk of conflict and negative peer influence.

As shown in Figures 3.2 and 3.3, the best fitting models at T3 and T5 were the three-profile and two-profile solutions, respectively. There was some continuity in peer

profiles that emerged at T3 and T5. At T3, the majority of students fell into the (T3-I) *positive peers group* ($n=346$, 61.63%), a profile that distinctly resembles T1-I and is distinguishable by low risk across peer domains. The remaining students were divided between (T3-II), the *unsupported peers group* ($n=106$, 19.01%), which is distinguishable by low risk of peer rejection, conflict, but high risk of poor support and negative peer influence, and the (T3-III) *bullies group* ($n=109$ 19.37%), a profile that is similar to T1-IV and denotes low risk of poor support, rejection, or conflict, but high levels of negative peer influence. At T5, the two-profile solution consisted of 78.16% ($n=294$) of students who fell into the (T5-I) *positive peers group*, distinctly resembles the T1-I and T3-I *positive peers* groups. The remainder of students in this group (21.84%; $n=82$) fell into the (T5-II) *bullies group*, which resembles the T1-IV and T3-III profiles identified in T1 and T3.

3.2 Identification of Peer Risk Trajectories (Aim 2)

After identifying the common peer profiles that emerged in T1, T3, and T5, patterns of movement across the three time points were examined (i.e., a mover stayer model) and sorted into groups with similar trajectory patterns based on continuity (“stayers”) or discontinuity (“movers”). Overall, twenty-four distinct trajectory patterns were identified, as seen in Table 6. Interestingly, only five percent of students in the full sample ($n=33$) exhibited trajectory patterns that were completely continuous, with 31 students remaining in the positive peers profile (Adj. Std. Res.= -5.6) and two students remaining in the bullies profile (Adj. Std. Res.= -.6) across all three time points. It was more common, however, for students to exhibit a semi-continuous pattern of movement. That is, many students began and ended in the same profile (at T1 and T5), but

experienced a single shift (in terms of peer risk) during the middle time point (T3). To better understand similarities and distinctions among students who evidenced similar trajectories, four distinct categories were identified, including two continuous (or semi-continuous) categories and two discontinuous categories. Each trajectory pattern was visually inspected and sorted into similar categories. The four identified profile trajectory groups are described below.

The overall risk (i.e., the sum of scores across the four peer risk domains for T1, T3, and T5) of each trajectory group and the average peer risk trajectory (i.e., the mean score of the four peer risk variables across the full sample) were used to understand distinctions in the characteristics of each group and are presented in Table 3.5 and Figure 3.4. The average trajectory (shown by a dotted, black line) was generally stable, gradually declining over time (T1 $M=5.11$, T3 $M=4.65$, T5 $M=4.08$).

Continuous / semi-continuous trajectory groups. The first and largest trajectory group was labeled as *positive peers continuous* (POS-CON) and comprised about half of the sample ($n=335$; 51.8%; see Table 3.5). As shown in Figure 3.4, this trajectory group was characterized by generally low levels of peer risk, lower than that of the Average comparison group, remaining consistently low across all three time points (T1 $M=3.78$, T3 $M=4.11$, T5 $M=3.35$). As mentioned above, few students remained in the positive peers profile across all three time points ($n=32$; 5.1% of the full sample). It was more common for students to begin and end in the positive peers group, experiencing a single middle time point (T3) shift. Many students in the POS-CON trajectory group shifted to the T3-II unsupported peers profile ($n=244$; 37.7%; Adj. Std. Res.=4.1) at T3, while

fewer students experienced a single middle shift to the T3-III bullies profile ($n=29$; 4.5%; Adj. Std. Res.=.8) at T3.

Interestingly, students experiencing a single middle shift to the unsupported peers profile (T3-II) or bullies profile (T3-III) evidenced trajectory patterns with slight qualitative differences, compared to their POS-CON peers. Rather than demonstrating trajectories characterized by positive relationships across the three time points (i.e., positive-positive-positive trajectories), at T3, these students evidenced a time-limited disturbance characterized by either low peer support (i.e., positive-unsupported-positive) or peer conflict and negative peer influence (i.e., positive-bullies-positive) in their course of development. Conceptually and statistically, these students were deemed to appear more similar to their POS-CON peers (as opposed to being their own distinct group) and were classified into the POS-CON trajectory group.

In contrast to the POS-CON group, the second trajectory group identified, labeled *negative peers continuous* (NEG-CON), was characterized by having the highest, consistent levels of peer risk among any of the groups (T1 $M=6.4$, T3 $M=5.91$, T5 $M=5.91$), and above that of the Average comparison group across all three time points. The NEG-CON trajectory emerged as the smallest group, with only 4.8% of students falling into this pattern ($n=31$). A consistent bullies profile (i.e., remaining in the bullies profile across all three time points) was very uncommon, with only two students exhibiting this consistent trajectory pattern (0.3% of students in the full sample; Adj. Std. Res.=-.6). As with the POS-CON pattern, many of the students in the NEG-CON trajectory group were in the bullies profile at T1 and T5, with a single middle-shift to the T3-II unsupported peers profile ($n=17$; 2.6%; Adj. Std. Res.=-2.0) or the T3-I positive

peers profile ($n=9$; 1.4%; Adj. Std. Res.=3.0) at T3. In addition to continuous/semi-continuous trajectory patterns, many students exhibited discontinuous patterns of risk, either beginning in a peer profile characterized by low risk (at T1 and/or T3) and increasing in risk by T5. Others began in a high peer risk profile at (T1 and/or T3) and progressed in low-risk peer profiles over time.

Discontinuous trajectory groups. Six percent ($n=44$) of youth were identified as *increasing risk* (I-RISK; see Table 3.5). Students in this trajectory group initially reported generally low levels of peer risk at T1 ($M=4.5$), that were below that of the Average comparison (T1 $M=5.11$; as shown in Figure 3.4). However, level of risk greatly increased for students in this group during T3 ($M=5.23$) and T5 ($M=5.68$), resulting in some of the high levels of risk, compared to other trajectory groups, just below that of the NEG-CON trajectory (see Figure 3.4). Ultimately, students in the I-RISK trajectory group followed a pattern that over time, led them to be classified in the T5-II *bullies* profile (T5). The trajectories of many of these students were characterized by a middle shift at T3 to the T3-II unsupported peers profile ($n=18$; 2.7% of students in the full sample; Adj. Std. Res.=1.5). Other students exhibited patterns that shifted directly from the positive peers profile to the bullies profile (at either T3 or T5). For example, 16 students (2.4%) demonstrated positive peers (T1)/positive peers (T3)/bullies (T5) trajectories (Adj. St. Res.= 5.6) and two students (0.3%) exhibited positive peers (T1)/bullies (T3)/bullies (T5) trajectory patterns (Adj. St. Res.=.8).

The final trajectory group, labeled *rocky start* (R-START), included 34.9% of the sample ($n=226$). In contrast to those in the I-RISK trajectory, R-START students had the highest levels of peer risk at T1 ($M=3.78$), surpassing those of students in the NEG-CON

trajectory group. However, R-START students' levels of peer risk decreased substantially in the middle (T3 $M=5.2$) and final (T5 $M=4.03$) time points, ultimately leading to a T5-I positive peers profile classification at T5. The majority of students in this trajectory group ($n=159$; shifted from the bullies profile (at T1) to the positive peers profile (at T5; $n=159$). Many of these students demonstrated a middle time point shift in peer risk to the T3-II unsupported peers profile at ($n=125$; 19.3% of the full sample; Adj. Std. Res.=2.0), while others shifted to the T3-I positive peers profile ($n=17$; 2.6%; Adj. Std. Res.=-3.0) or T3-III bullies profile ($n=17$; 2.6%; Adj. Std. Res.=0.6) profile at T3. Although less common, another pattern observed in the R-START group was for students to remain in the unsupported peers profile at T1 and T3, but transition to the positive peers profile at T5 ($n=25$; 3.9%; Adj. Std. Res.=1.1).

3.3 Descriptive Statistics for Trajectory Groups

In order to gain a better understanding of the sample among the four peer risk subgroups, descriptive statistics (e.g., means, standard deviations) and correlations for main study variables (i.e., peer risk and contextual support variables), demographic/background characteristics (i.e., age, gender, race, free/reduced lunch status, annual household income), internalizing problems, externalizing problems, and failing grades are presented next for each of the trajectory groups. Results from the tests used to examine potential group differences between the trajectory groups (e.g., Analysis of Covariance [ANCOVA], Logistic Regression, Chi Square) in demographic/background characteristics (age, gender, race, free/reduced lunch status, annual household income), internalizing problems, externalizing problems, failing grades, and the three contextual support variables (family, school, and community support) are

presented next. ANCOVA was also used to examine potential group differences between the trajectory groups for the family, school, and community support variables. Results from these analyses are presented last.

Means and standard deviations for the contextual support variables, internalizing problems, externalizing problems, and age across each of the trajectory groups, as well as the average comparison (full sample), are presented in Table 3.5. Information regarding sample distribution (i.e., total number of cases and percentage of cases that meet a particular condition) for each trajectory group can be found in Table 3.6. Correlations across main study variables and potential covariates are presented in Table 3.7.

Descriptive statistics for trajectory groups. Cut-off scores are used to aid in interpretation of the descriptive statistics. Cut-off scores allow for understanding of high and low levels of contextual support and peer risk across variables. Overall, most students were about 15 years old and identified as white/Caucasian (average of full sample $n=326$, 50.4%) and male ($M=15.29$, $SD=.99$) at T1, as seen in Tables 3.5 and 3.6. Additionally, on average, the overall sample (i.e., average peer risk comparison of the full sample) indicated low levels of family support ($M=18.06$, $SD=4.5$) and school support ($M=2.54$, $SD=.73$), and moderate levels of community support ($M=1.5$, $SD=.84$ variables). Overall, students in the full sample reported high levels of internalizing problems ($M=61.34$, $SD=13.8$) and moderate levels of externalizing problems ($M=66.15$, $SD=14$).

Descriptive statistics for POS-CON. As seen in Tables 3.5-3.6, students in the POS-CON group ($n=335$) reported generally high levels of family ($M=17.5$) and

community ($M=1.73$) support, but low levels of school support ($M=2.61$). Across the three time points, these students showed low levels of risk across all peer variables: peer support (T1 $M=1.13$, T3 $M=1.32$, T5 $M=1.19$), peer rejection (T1 $M=1.14$, T3 $M=1.07$, T5 $M=1.01$), negative peer influence (T1 $M=0.76$, T3 $M=1.13$, T5 $M=0.97$), and especially peer conflict (T1 $M=0.75$, T3 $M=0.59$, T5 $M=0.58$). Overall, students in the POS-CON trajectory group exhibited very low levels of overall peer risk (i.e., sum of scores across all four peer variables) across the three time points: T1 ($M=3.78$) and T3 ($M=4.11$), and T5 ($M=3.35$).

Similar to the descriptive data from the full sample, students in the POS-CON trajectory identified as white ($n=193$, 57.6%), male ($n=224$, 66.9%) and were either 15 or 16 years old at T1 ($n=212$, 63.3%, presented in Table 3.6). Per parent report, most students in the POS-CON group lived in households that earned less than a \$40,000 family income annually ($n=215$, 64.1%) and received free or reduced lunch at school ($n=236$, 70.4%). About 70% of students in this group received at least one failing grade during the two most recent grading periods ($n=313$, 70.1%) reported high levels of internalizing problems ($M=61.32$, $SD=13.3$) and moderate levels of externalizing problems ($M=65.82$, $SD=13.3$). Compared to the other trajectory groups, students in POS-CON had the highest rate of graduation ($n=179$, 53.4%; NEG-CON $n=10$, 32.3%; I-RISK $n=19$, 43.2%, R-START $n=118$, 52.2%)

Descriptive statistics for NEG-CON. Students in the NEG-CON group ($n=31$) exhibited low levels of support across the contextual variables at T1 (family support $M=18.48$; school support $M=2.46$; community support $M=1.73$). Regarding the peer risk variables, across time points, they showed generally low levels of risk across the peer

support (T1 $M=1.18$, T3 $M=1.10$, T5 $M=1.08$) and peer rejection ($M=1.01$, $M=.7$, $M=.69$) variables, but very high risk for Peer Conflict ($M=2.35$, $M=1.30$, $M=2.39$) and Negative Peer Influence ($M=2.77$, $M=2.12$, $M=2.14$) variables. Overall, students in the NEG-CON trajectory group exhibited very high levels of total peer risk (i.e., sum of scores across all four peer variables) at T1 ($M=6.4$), and high levels at T3 ($M=5.91$) and T5 ($M=5.91$).

Regarding demographic and other descriptive information (presented in Table 3.6), most of the students in the NEG-CON trajectory identified as white ($n=15$, 48.4%), male ($n=21$, 67.7%), and were either 15 or 16 years old at T1 ($n=21$, 67.8%). Twenty-two students in this group received free/reduced lunch at school (71%) and over forty percent lived in households earning an income of less than \$20,000 annually ($n=13$, 41.9%), and reported low levels of internalizing problems ($M=57.29$, $SD=65.55$) and moderate levels of externalizing problems ($M=65.55$, $SD=14.5$). Compared to the other trajectory groups, students in NEG-CON were identifiable by their very high number of failing grades and high rate of HSDO. Almost 40% of students in NEG-CON received three or more failing grades during the two most recent grading periods ($n=12$; 38.7%), compared to students in the other trajectory groups (POS-CON $n=119$, 35.5%; I-RISK $n=15$, 34.1%; R-START $n=73$, 32.3%) and over 67% of these students ($n=21$) were identified as leaving school early without a diploma by T5 (POS-CON $n=156$, 46.6%, I-RISK $n=25$, 56.8%, R-START $n=108$, 47.8%).

Descriptive statistics for I-RISK. Students in the I-RISK group ($n=44$) exhibited low levels of family support ($M=18.59$) and school support ($M=2.59$), and moderate levels of community support ($M=1.47$). Across the three time points, I-RISK students showed generally low levels of risk for peer support (T1 $M=1.21$, T3 $M=1.31$, T5

$M=1.23$), peer rejection ($M=1.11$, $M=1.0$, $M=1.0$), and negative peer influence (T1 $M=.86$, T3 $M=1.43$, T5 $M=1.15$). Although these students had low risk for peer conflict at T1 ($M=1.32$) and T5 ($M=2.3$), they evidenced moderate levels of risk at T3 ($M=1.49$). Overall, students in the I-RISK trajectory group exhibited low levels of total peer risk (i.e., sum of scores across all four peer variables) at T1 ($M=4.5$), but high levels at T3 ($M=5.23$) and T5 ($M=5.68$).

Similar to the other trajectory patterns, most students in the I-RISK trajectory identified as white ($n=26$, 59.1%), male ($n=29$, 65.9%) and were either 15 or 16 years old at T1 ($n=27$, 61.4%). About 68 percent of students were identified as having at least one failing grade ($n=30$) and students in this group reported very high levels of internalizing problems ($M=66.31$, $SD=13.98$) and moderate levels of externalizing problems ($M=64.4$, $SD=15.76$). Although similar to the other trajectory groups across many of the demographic areas, students in the I-RISK trajectory group evidenced a high rate of Socioeconomic status (SES) risk factors. As seen in Table 3.6, many of these students received free/reduced lunch at school ($n=34$, 77.3%; compared to POS-CON $n=236$, 70.4%, NEG-CON $n=22$, 71.0%, R-START $n=145$, 64.2%) and lived in households earning below an annual income of \$40,000 ($n=33$, 75%; compared POS-CON $n=215$, 64.1%; NEG-CON $n=21$, 67.7%; R-START $n=149$, 66.0%). Over half of the students in the I-RISK trajectory group were identified as leaving school early without a diploma by T5 ($n=25$, 56.8%).

Descriptive statistics for R-START. Students in the R-START group ($n=226$) exhibited low levels of support across contexts: family support ($M=18.69$), school support ($M=2.44$), and community ($M=1.55$). Across the three time points, these students

showed low levels of risk for peer rejection (T1 $M=21$, T3 $M=1.13$, T5 $M=1.01$) and peer conflict (T1 $M=1.38$, T3 $M=.74$, T5 $M=.24$), moderate levels of risk for peer support at T1 ($M=1.49$), and low levels of risk at T3 ($M=1.36$) and T5 ($M=1.41$). However, students in the R-START group exhibited very high levels of risk for negative peer influence at T1 ($M=2.78$), T3 (1.97), and T5 (1.37). Overall, students in the R-START trajectory group exhibited very high levels of overall peer risk (i.e., sum of scores across all four peer variables) at T1 ($M=6.85$) and T3 ($M=5.2$), and moderate levels of overall peer risk at T5 ($M=4.03$).

Similar to the other trajectory patterns, most students in the R-START trajectory identified as white ($n=119$, 52.7%), male ($n=151$ 68.8%) and were either 15 or 16 years old at T1 ($n=156$, 69%). Over 70% of students in this group received at least one failing grade during the two most recent grading periods ($n=161$, 71.1%) and reported high levels of both internalizing problems ($M=61.62$, $SD=14.4$) and externalizing problems ($M=66.71$, $SD=14.7$). Overall, students in the R-START group were difficult to distinguish from students in other groups. However, defining characteristics for these students include their high rates of students receiving a regular priced lunch at school and high rates of graduation. Almost 32% of parents of students in the R-START group reported that their child did not receive a free/reduced lunch at school ($n=72$), compared to the other trajectory groups (POS-CON $n=87$, 26%; NEG-CON $n=9$, 29%, I-RISK $n=8$, 18.2%). Additionally, over half of students in the R-START group was identified as graduating from high school by T5 ($n=118$, 52.2%).

Correlations among study variables at T1. Several of the peer risk variables was significantly correlated with one another (seen in Table 3.2). Higher levels of risk for

peer conflict was significantly associated with higher risk for negative peer influence ($r=.223, p<.001$). None of the contextual support variables (family support, school support, community support) were significantly associated with one another.

There were also several peer risk variables correlated with areas of contextual support. Higher risk for peer support for learning was significantly associated with higher levels of school support ($r=-.378, p<.001$). Higher levels of risk for peer rejection was significantly associated with lower levels of family support ($r=.104, p<.05$) and community support ($r=.206, p<.001$). Higher levels of risk for peer conflict was significantly associated with higher levels of school support ($r=-.145, p<.001$); and higher levels of risk for negative peer influence was significantly associated with lower levels of family support ($r=.187, p<.001$).

Regarding the continuous demographic variables included for consideration as potential covariates (internalizing problems, externalizing problems, and age), several variables were significantly associated with one another. Higher levels of externalizing problems were significantly associated with higher levels of internalizing problems ($r=.416, p<.001$). Additionally, higher levels of externalizing problems were significantly associated with lower age ($r=-.096, p<.05$).

Tests examining group differences. Results from the series of tests used to examine potential group differences between the trajectory groups (e.g., Analysis of Covariance [ANCOVA], Logistic Regression, Chi Square) for each of the demographic and descriptive variables (listed above) indicated no statistically significant differences between groups. Results from the ANCOVA used to examine potential group differences

between the trajectory groups based on family, school, and community support variables also indicated no statistically significant differences, suggesting that students in each trajectory group did not differ significantly based on these characteristics.

3.4 Association Between Peer Risk Trajectories and HSDO (Aim 3)

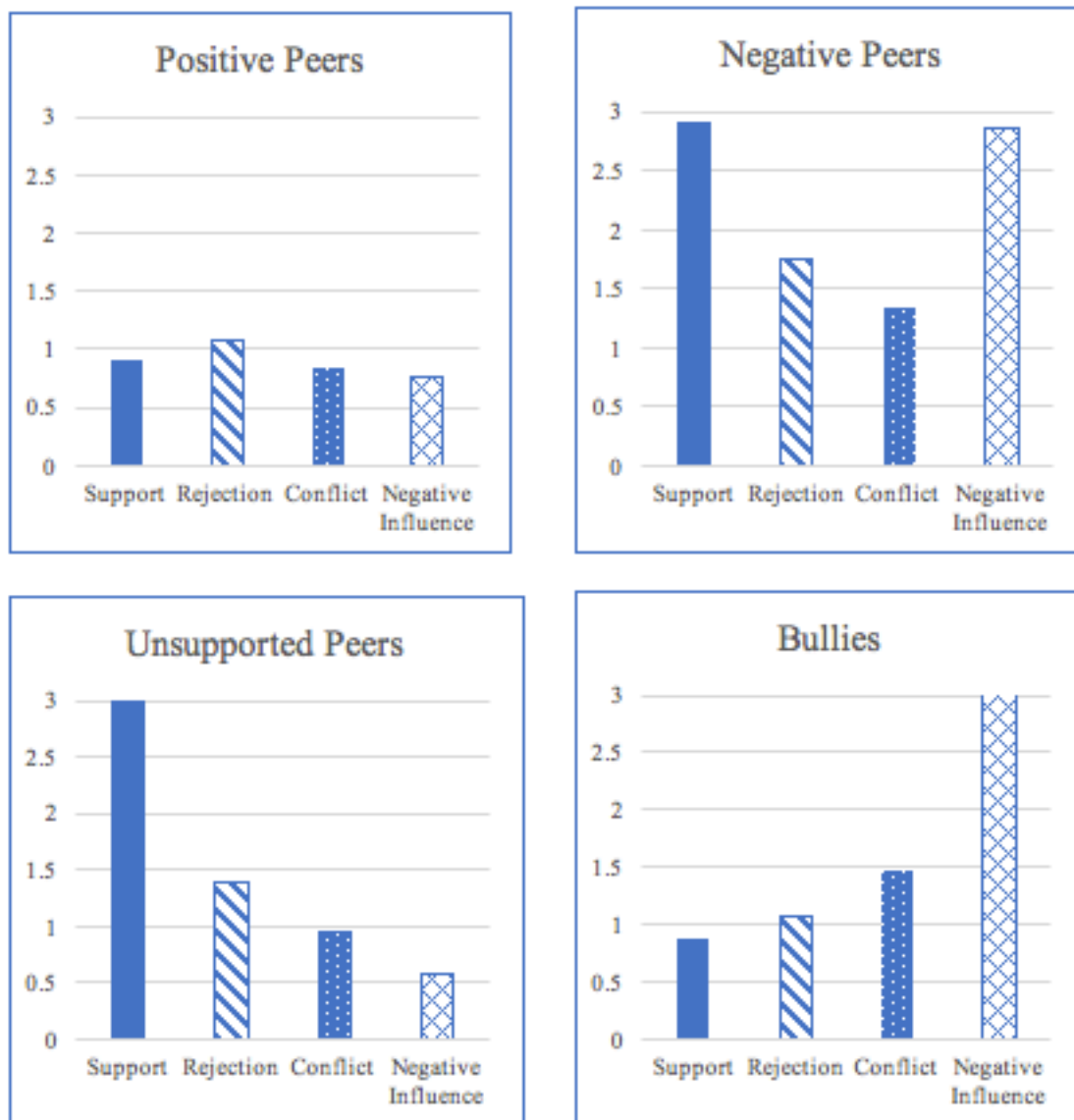
To examine Aim 3, Binary Logistic Regression (logistic regression) was used to assess the relationship between peer trajectory group membership and HSDO. As certain characteristics may make HSDO more likely for some students than others, prior to running the logistic regression, the following variables were assessed and considered for inclusion as potential covariates in the model: age, treatment condition of the larger study, gender, race, free/reduced lunch status, annual household income, failing grades, internalizing problems, and externalizing problems. Overall, Age, Treatment Condition, and Free/Reduced Lunch Status were included as covariates in the model because they were significantly related to the outcome and not highly associated with each other or the other predictors. All assumptions of regression were assessed and met prior to running the analyses.

In the first regression model, logistic regression was used to examine the effects of peer trajectory group membership on HSDO. POS-CON was included as the reference group in the model. The overall model was statistically significant, $\chi^2(6) = 51.605, p < .001$, explaining 10.8% (Nagelkerke R^2) of the variance in HSDO, and correctly classifying 61.5% of cases. Sensitivity was 68.5%, specificity was 54.2%, positive predictive value was 61.08% and negative predictive value was 62.07%. Of the three predictor variables (i.e., NEG-CON, I-RISK, and R-START), only the NEG-CON model

was statistically significant (as shown in Table 3.7). The odds of HSDO was 2.37 times greater for those in the NEG-CON group, as opposed to those in the POS-CON group.

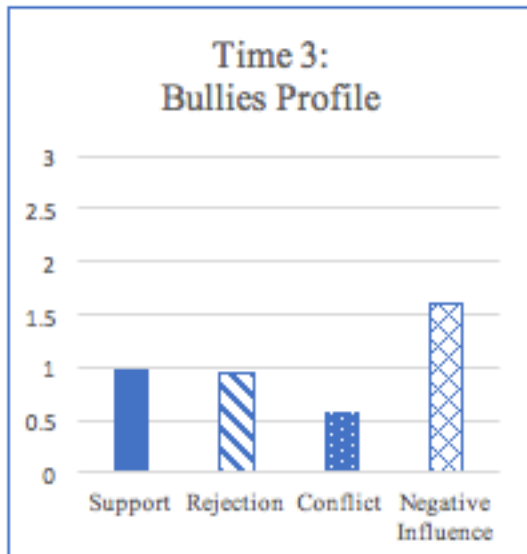
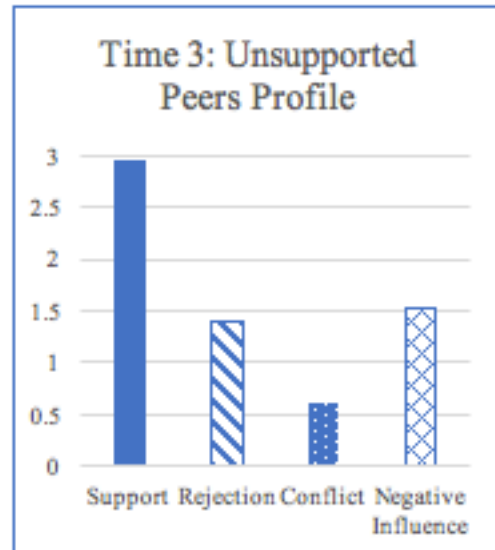
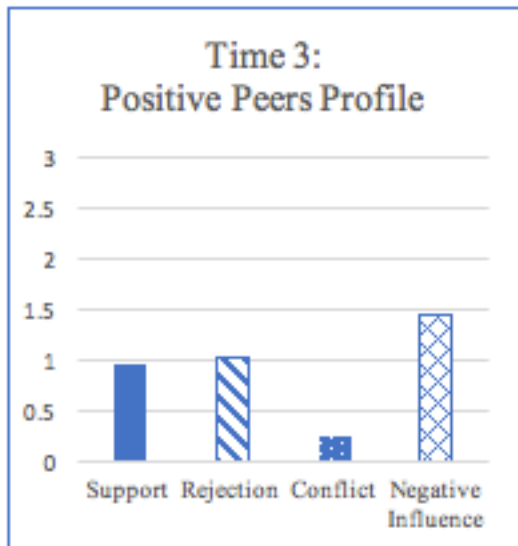
3.4 Contextual Support Associated with NEG-CON (Aim 4).

When compared to the POS-CON reference group, the NEG-CON trajectory was the only trajectory pattern significantly associated with HSDO. Thus, to address Aim 4, the second logistic regression model examined whether support within the family, school, or community contexts significantly predicted group membership to the NEG-CON trajectory pattern. As in the first model, variables that may influence the outcome were assessed and considered for inclusion in the model and the assumptions of regression were examined and met prior to running the model. None of the variables were significantly related to the outcome. Therefore, no variables were included in the model as covariates. Results indicated that none of the contextual support variables significantly predicted being in the NEG-CON peer trajectory group, as seen in Table 3.8.



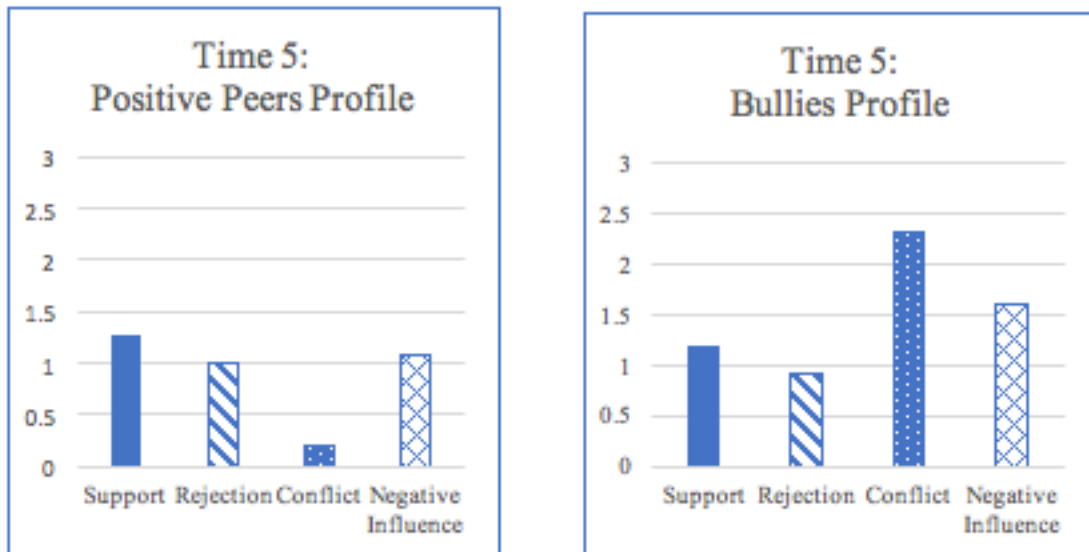
Note. Higher scores indicate higher levels of risk.

Figure 3.1. *Peer Risk Profiles at Time One (T1).*



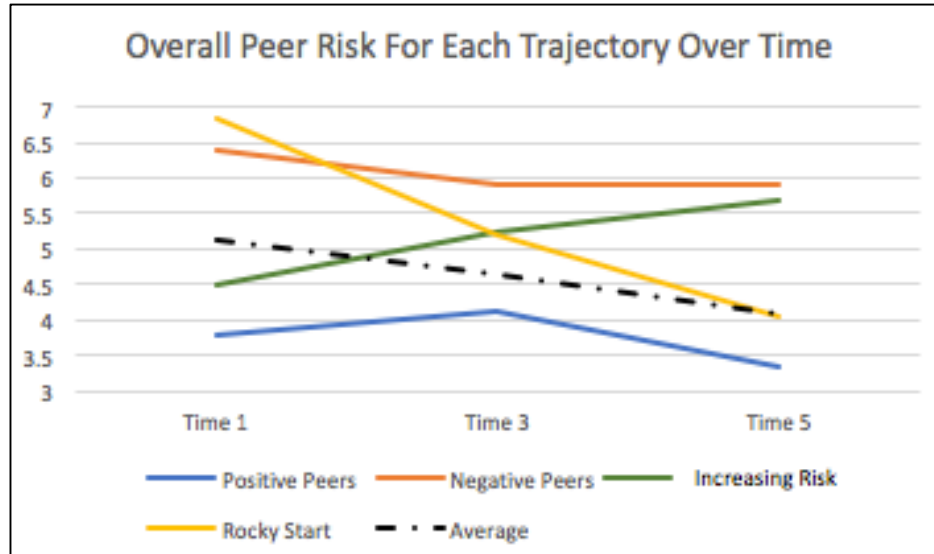
Note. Higher scores indicate higher levels of risk.

Figure 3.2. *Peer Risk Profiles at Time Three (T3).*



Note. Higher scores indicate higher levels of risk.

Figure 3.3. *Peer Risk Profiles at Time Five (T5).*



Notes. Overall Peer Risk indicates the total levels of risk (i.e., sum scores) across the four peer risk variables. Higher scores indicate higher levels of peer risk. The average trajectory was calculated using mean scores.

Figure 3.4. Overall scores of peer risk trajectories (i.e., sum scores across four areas of risk) over time, average level, and latent class trajectories.

Table 3.1. *Demographic and descriptive information for main study variables (N=647).*

	<i>M (SD)</i>	<i>Missing Data n (%) *</i>
<i>Peer Support*</i>		
Time 1	1.27 (.95)	23 (3.55)
Time 3	1.33 (.96)	120 (18.54)
Time 5	1.24 (.9)	291 (44.98)
<i>Peer Rejection*</i>		
Time 1	1.16 (.89)	28 (4.33)
Time 3	1.07 (.89)	128 (19.78)
Time 5	.99 (.86)	310 (47.91)
<i>Peer Conflict*</i>		
Time 1	1.09 (1.22)	9 (1.39)
Time 3	.76 (1.1)	233 (3.60)
Time 5	.65 (1.0)	284 (43.89)
<i>Negative Peer Influence*</i>		
Time 1	1.59 (1.3)	23 (3.55)
Time 3	1.49 (1.24)	125 (19.32)
Time 5	1.2 (1.17)	309 (47.76)
<i>Contextual Support**</i>		
Family	18.06 (4.5)	65 (10.05)
School	2.54 (.73)	26 (14.02)
Community	1.5 (.84)	96 (14.08)
<i>Internalizing Problems**</i>	61.34 (13.8)	23 (3.55)
<i>Externalizing Problems**</i>	66.15 (14.0)	21 (3.25)
<i>Age**</i>	15.29 (.99)	--
<i>Failing Grades **</i>	1.57 (1.24)	3 (.46)

Notes: Full information maximum-likelihood estimators were used for participants with partial missing data. * Higher values indicate higher levels of risk. ** signifies data that was collected at the first time point (time 1) of the larger study.

Table 3.2. *Correlations for main study variables and scale variables considered as potential covariates in the logistic regression models.*

Scale	1	2	3	4	5	6	7	8	9	10
1 Peer Support	1	.22**	.01	-.05	.07	.38**	.07	-.01	-.01	.01
2 Peer Rejection	.22**	1	-.05	.04	.1*	.04	.21**	-.01	.07	-.04
3 Peer Conflict	.01	-.05	1	.22**	.04	-.15**	.02	.02	-.01	.06
4 Negative Peer Inf.	-.05	.03	.22**	1	.19**	-.04	.07	.05	.01	.06
5 Family Support	.07	.10	.04	.19**	1	-.02	.07	-.1*	.05	-.04
6 School Support	-.38**	.04	-.15**	-.04	-.02	1	.06	-.03	.03	.04
7 Community Support	.07	.21**	.02	.07	.07	.06	1	-.05	-.1	.07
8 Externalizing Problems	-.01	-.01	.023	.05	-.1*	-.03	-.05	1	.45**	-.1*
9 Internalizing Problems	-.01	.07	-.01	.01	.05	.03	-.06	.42**	1	-.06
10 Age	.01	-.04	.06	.03	-.04	.04	.04	.07	-.1*	1

Notes: * indicates a *p*-value of <.05; **indicates a *p*-value of <.001.

3.3 Table 5. *Latent Profile Analysis statistics.*

	# free parameters	Loglikelihood	AIC	BIC	aBIC	Entropy	Avg. Latent Class	LMR-LRT value	<i>p</i>
<u>T1</u>									
2 class	13	-3598.812	7223.625	7281.583	7240.309	0.907	0.971	258.487	0.000
3 class	18	-3548.452	7132.905	7213.155	7156.006	0.802	0.896	99.534	0.000
4 class	23	-3481.777	7009.555	7112.097	7039.073	0.885	0.915	131.317	0.000
5 class	28	-3270.093	6596.187	6721.020	6632.122	0.972	0.960	43.595	0.000
6 class	33	-3251.967	6569.933	6717.058	6612.286	0.960	0.949	36.047	0.000
<u>T3</u>									
2 class	13	-2776.103	5578.205	5634.538	5593.269	0.834	0.933	195.994	0.000
3 class	18	-2722.532	5481.064	5559.063	5501.922	0.783	0.922	105.626	0
4 class	23	-2676.593	5399.185	5498.851	5425.837	0.793	0.915	88.402	0.000
5 class	28	-2452.924	4961.848	5083.180	4994.294	0.746	0.897	38.666	0.0000
<u>T5</u>									
2 class	13	-1847.288	3720.577	3771.696	3730.450	0.937	0.989	176.247	0.000
3 class	18	-1793.195	3622.389	3693.170	3636.060	0.921	0.978	106.985	0
4 class	23	-1493.593	3033.186	3123.628	3050.654	0.969	0.994	584.639	0
5 class	28	-1474.609	3005.219	3115.322	3026.484	0.933	0.964	37.691	0

Notes. AIC=Akaike information criterion, BIC=Byesian information criterion (BIC), aBIC=adjusted BIC (aBIC). Avg. Latent Class indicates the average latent class probability for most likely class membership. LMR-LRT=Lo-Mendell-Rubin Likelihood Ratio test. T1=data collected at time 1. T2=data collected at time 2. T3=data collected at T3.

Table 3.4. *Distinct trajectory patterns across time points.*

	Profile Classification			<i>n</i>
	at T1 *	at T3 **	at T5 ***	
<u>POS-CON Trajectories</u>				
<i>(n=335, 51.8%)</i>				
	1	1	1	31
	2	1	1	4
	1	2	1	(244)
	1	3	1	29
	3	3	1	27
<u>NEG-CON Trajectories</u>				
<i>(n=31, 4.8%)</i>				
	2	2	2	1
	2	2	3	2
	4	3	2	2
	4	2	2	17
	2	1	2	(2)
	4	1	2	(9)
	3	1	2	1
	3	2	2	2
	3	3	2	5
<u>I-RISK Trajectories</u>				
<i>(n=44, 6.8%)</i>				
	1	1	2	(16)
	1	2	2	18
	1	3	2	2
	3	1	2	1
	3	2	2	2
	3	3	2	5
<u>R-START Trajectories</u>				
<i>(n=226, 34.9%)</i>				
	3	1	1	3
	3	2	1	25
	2	2	1	21
	2	3	1	18
	4	1	1	17
	4	2	1	(125)
	4	3	1	17

Notes. T1=Data collected at Time 1. T2=Data collected at Time 2. T3=Data collected at Time 3. POS-CON=Positive Peers trajectory, NEG-CON=Negative Peers trajectory, I-RISK=Increasing Risk trajectory, R-START=Rocky Start trajectory. Parentheses are used to identify statistically significant trajectory patterns. * *At T1, 1=positive peers profile, 2=negative peers profile, 3=unsupported peers profile, 4=bullies profile.* ** *At T2, 1=positive peers profile, 2=unsupported peers, 3=bullies.* *** *At T3, 1=positive peers, 2=bullies. Adjusted Standardized Residuals appear in parentheses.*

Table 3.5. Descriptive information for each of the trajectory groups and the average peer risk comparison group, including main study variables and potential covariates.

	Average Peer Risk Comparison (N=647) <i>M (SD)</i>	POS-CON (n=335) <i>M (SD)</i>	NEG-CON (n=31) <i>M (SD)</i>	I-RISK (n=44) <i>M (SD)</i>	R-START (n=226) <i>M (SD)</i>
<i>Peer Support*</i>					
Time 1	1.27 (.95)	1.13 (.81)	1.18 (.97)	1.21 (1.02)	1.49 (1.08)
Time 3	1.33 (.96)	1.32 (.99)	1.10 (.74)	1.31 (.96)	1.36 (.92)
Time 5	1.24 (.9)	1.19 (.87)	1.08 (.7)	1.23 (.94)	1.41 (.99)
<i>Peer Rejection*</i>					
Time 1	1.16 (.89)	1.14 (.9)	1.01 (.54)	1.11 (.9)	1.21(.91)
Time 3	1.07 (.89)	1.07 (.87)	.7 (.58)	1 (.87)	1.13 (.93)
Time 5	.99 (.86)	1.01 (.88)	.69 (.6)	1 (.94)	1.01 (.84)
<i>Peer Conflict*</i>					
Time 1	1.09 (1.22)	.75 (1.12)	2.35 (1.17)	1.32 (1.14)	1.38 (1.19)
Time 3	.76 (1.1)	.59 (1.03)	1.30 (1.11)	1.49 (1.34)	.74 (.99)
Time 5	.65 (1.0)	.18 (.39)	2.39 (.72)	2.3 (.67)	.24 (.43)
<i>Negative Influence*</i>					
Time 1	1.59 (1.3)	.76 (.66)	2.77 (.5)	.86 (.61)	2.78 (1.05)
Time 3	1.49 (1.24)	1.13 (1.11)	2.12 (1.03)	1.43 (1.1)	1.97 (1.29)
Time 5	1.2 (1.17)	.97 (1.02)	2.14 (1.04)	1.15 (1.16)	1.37 (1.32)
<i>Overall Peer Risk*</i>					
Time 1	5.11	3.78	6.4	4.5	6.85
Time 3	4.65	4.11	5.91	5.23	5.2
Time 5	4.08	3.35	5.91	5.68	4.03
<i>Contextual Support**</i>					
Family	18.06 (4.5)	17.5 (4.55)	18.48 (4.57)	18.59 (3.92)	18.69 (4.46)
School	2.54 (.73)	2.61 (.71)	2.46 (.75)	2.59 (.72)	2.44 (.744)
Community	1.5 (.84)	1.44 (.79)	1.73 (.83)	1.47 (.92)	1.55 (.905)
<i>Internalizing **</i>	61.34 (13.8)	61.32 (13.6)	57.29 (9.17)	66.31 (13.98)	61.62 (14.4)
<i>Externalizing **</i>	66.15 (14.0)	65.82 (13.3)	65.55 (14.5)	64.4 (15.76)	66.71 (14.7)
<i>Age**</i>	15.29 (.99)	15.26 (1.02)	15.26 (1.0)	15.39 (1.1)	15.31 (0.92)

Notes. POS-CON=Positive Peers, NEG-CON=Negative Peers, I-RISK=Increasing Risk, R=START=Rocky Start. Overall Peer Risk indicates the total level of risk (i.e., sum) across the four peer risk variables. * *higher values indicate higher levels of risk.* ** signifies data that was collected at the first time point (time 1) of the larger study.

Table 3.6. *Descriptive information for each of the latent trajectory patterns, collected at T1.*

	POS-CON (n=335) n (%)	NEG-CON (n=31) n (%)	I-RISK (n=44) n (%)	R-START (n=226) n (%)
<i>Gender</i>				
Male	224 (66.9)	21 (67.7)	29 (65.9)	151 (68.8)
Female	111 (33.1)	10 (32.3)	15 (34.1)	75 (33.2)
<i>Age</i>				
13-14	86 (25.7)	6 (19.3)	10 (22.7)	46 (20.4)
15-16	212 (63.3)	21 (67.8)	27 (61.4)	156 (69.0)
17-18	37 (11.1)	4 (12.9)	7 (15.9)	24 (10.6)
<i>Treatment Condition</i>	111 (33.1)	13 (41.9)	19 (43.2)	69 (30.5)
<i>Race</i>				
White	193 (57.6)	15 (48.4)	26 (59.1)	119 (52.7)
Black, Latino, or Other	139 (41.5)	16 (51.6)	18 (40.9)	106 (46.9)
<i>Lunch Status*</i>				
Free/Reduced	236 (70.4)	22 (71.0)	34 (77.3)	145 (64.2)
Regular	87 (26.0)	9 (29.0)	8 (18.2)	72 (31.9)
Missing	12 (3.6)	--	2 (4.5)	9 (4.0)
<i>Annual Household Income*</i>				
\$0 to \$20,000	111 (33.1)	13 (41.9)	18 (40.9)	77 (34.1)
\$20,001 to \$40,000	104 (31.0)	8 (25.8)	15 (34.1)	72 (31.9)
\$40,001 to \$60,000	52 (15.5)	5 (16.1)	6 (13.6)	30 (13.3)
\$60,001 +	12 (3.6)	5 (16.2)	3 (6.9)	34 (15.7)
Missing	17 (5.1)	--	2 (4.5)	11 (4.9)
<i>Failing Grades**</i>				
0 Failing Grades	98 (29.3)	9 (29.0)	14 (31.8)	62 (27.4)
1 Failing Grade	68 (20.3)	5 (16.1)	9 (20.5)	52 (23.0)
2 Failing Grades	48 (14.3)	5 (16.1)	6 (13.6)	38 (16.8)
3+ Failing Grades	119 (35.5)	12 (38.7)	15 (34.1)	73 (32.3)
Missing	2 (0.6)	--	--	--
<i>School Outcome</i>				
HSDO	156 (46.6)	21 (67.7)	25 (56.8)	108 (47.8)
Graduation	179 (53.4)	10 (32.3)	19 (43.2)	118 (52.2)

Notes. POS-CON=Positive Peers trajectory, NEG-CON=Negative Peers trajectory, I-RISK=Increasing Risk trajectory, R=START=Rocky Start trajectory. Treatment Condition signifies group membership to the intervention condition of the larger study. Lunch Status indicates that the student received free or reduced lunch at school. HSDO=High School Dropout. * signifies information that was reported by parents or guardians. ** identifies obtained from school report cards during the two most recent grading periods.

Table 3.7. *Logistic Regression predicting likelihood of high school dropout (HSDO) based on group membership to peer trajectory patterns.*

	<i>B</i>	SE	Wald	<i>df</i>	<i>p</i>	Odds Ratio	95% CI for Odds Ratio	
							Lower	Upper
Level 1								
Age	-.23	.09	7.23	1	.007	.79	.67	.94
Treatment Condition	-1.07	.18	34.78	1	<.001	.34	.24	.49
Free/Reduced Lunch Status	.33	.19	3.11	1	.078	1.39	.964	2.01
Level 2								
NEG-CON	.86	.41	4.42	1	.036	2.37	1.06	5.3
I-RISK	.45	.35	1.69	1	.193	1.57	.8	3.09
R-START	.126	.183	.470	1	.493	1.13	.79	1.62

Notes. The POS-CON (i.e., positive peers) trajectory is used as the reference group in the analyses. CI= Confidence Interval, POS-CON=Positive Peers trajectory, NEG-CON=Negative Peers trajectory, I-RISK=Increasing Risk trajectory, R=START=Rocky Start trajectory.

Table 3.8. *Logistic Regression predicting likelihood of negative peers continuous (NEG-CON) trajectory based on family, school, and community support.*

	<i>B</i>	SE	Wald	<i>df</i>	<i>p</i>	Odds Ratio	95% CI for Odds Ratio	
							Lower	Upper
Family Support	.01	.05	.08	1	.78	1.01	.93	1.11
School Support	- .16	.3	.3	1	.6	.86	.48	1.53
Community Support	.2	.24	.65	1	.42	1.2	.74	1.93

Note. CI=Confidence Interval.

CHAPTER 4

DISCUSSION

The current study utilized a pattern-centered approach to examine the unique trajectories of peer risk in order to understand intraindividual differences among youth at risk for HSDO. This type of approach fills a meaningful gap in the HSDO literature, allowing for investigation of intraindividual differences that cannot be accounted for by traditional variable-centered analyses. This study also investigated the association among peer risk trajectory patterns and two educational outcomes (HSDO or graduation), as well as the predictive relationship among early contextual support (in family school and community contexts) and group membership to a specific trajectory pattern.

The present study is the first to utilize a pattern-centered approach to identify latent subpopulations of students based on patterns of peer risk (i.e., support, rejection, conflict, and negative influence) and map their trajectories over time to predict HSDO. These results expand on previous findings documenting the importance of early identification of students who may be at-risk and early intervention (e.g., Hickman et al., 2008), to promote positive outcomes. Consistent with previous literature on youth development, findings from the present study also document diverse and non-continuous patterns of peer relationships that youth may experience during the adolescent period (Smetana, et al., 2006). Additionally, findings may have important implications for early identification and intervention for students who may be at risk to increase the changes of

high school graduation and reduce the changes of HSDO. Results from the analyses are discussed below, along with future directions and implications of these findings.

4.1 Peer Risk Profiles and Trajectory Patterns Across Time

Results of the first and second aims of the study revealed four peer risk trajectory patterns across three time points: Positive Continuous (POS-CON), Negative Continuous (NEG-CON), Increasing Risk (I-RISK), and Rocky Start (R-START). Consistent with the adolescent development literature (e.g., Collins & Steinberg, 2006), students in the sample evidenced complex and turbulent peer risk trajectory patterns, with only 32 individuals (4.9%) following trajectories that were completely continuous POS-CON or NEG-CON (e.g., positive-positive-positive or negative-negative-negative) and 615 students (95.1%) exhibiting patterns that were either semi-continuous (e.g., positive-negative-positive) or discontinuous (e.g., positive-negative-negative) across the time points. This was not surprising, given the findings from previous researchers documenting the complex and diverse changes (e.g., cognitive, social, emotional, biological) that individuals experience during the adolescent period (Brown, 1990; Brown & Larson, 2009).

Given the high-risk nature of the sample, it was interesting that the majority of students fell into trajectories characterized by either continuous low peer risk (POS-CON $n=335$, 51.78%) across the three time points or decreasing levels of peer risk (R-START $n=226$, 34.93%) over time, compared to the NEG-CON ($n=31$, 4.8%) and the I-RISK ($n=44$, 6.8%) trajectory groups. Because youth experience vast changes in brain development during adolescence, they may experience biases in the way they process

social information, such as overestimating their popularity (Putarek & Kerestes, 2016) or inflating the degree of positivity in social interactions (Balthazor, 1996). As such, it is possible that students in this sample had inflated perceptions of their peer relationships, potentially communicating certain aspects of their peer relationships in an overly positive light.

Interestingly, many of students classified into the POS-CON group evidenced a trajectory pattern that had slight qualitative differences, in comparison to their POS-CON peers. Rather than evidencing trajectories characterized by positive relationships across the three time points (i.e., positive-positive-positive trajectories), at T3, these students demonstrated a time-limited disturbance characterized by either low peer support (i.e., positive-unsupported-positive) or peer conflict and negative peer influence (positive-bullies-positive) in their course of development. Although in the present study, these students were deemed similar to other students in the POS-CON group and classified as POS-CON (as opposed to their own distinct trajectory group), youth exhibiting these trajectories may be evidencing a “developmental disturbance,” or a period of “developmental limited deviance that is statistically normative, culturally sanctioned, and time prescribed” (Schulenberg et al., 2001; p. 474). Thus, it may be useful for future researchers interested in understanding peer risk trajectories, including disturbances or discontinuities in development, to examine the possibility of these students being a unique subgroup and to examine this trajectory pattern more closely.

4.2 Peer Risk Trajectories and HSDO

Results from the third aim of the study supported the hypothesis that, when compared to the POS-CON reference group, group membership to the NEG-CON trajectory pattern significantly predicted HSDO. This finding was consistent with findings from previous studies documenting negative impacts of poor peer relationships on outcomes for youth, (e.g., Benner, 2011; Greenman et al., 2009). Previous researchers have shown that during the adolescent period of development, youth are more strongly influenced by their peers than in other developmental periods (e.g., Veenstra & Steglich, 2012). Therefore, it is not surprising that youth engaging in peer relationships characterized by poor support, rejection, conflict, and negative influence are adversely impacted in various ways, including school outcomes.

Given the long history of difficulties that students with poor peer relationships often experience, documented as beginning as early as Kindergarten (e.g., see Buhs et al., 2006; Greenman et al., 2009), it is possible that students in the NEG-CON group exhibited difficult peer relationships for many years, prior to this study. Social learning theory (Petraitis, Flay, & Miller, 1995) may suggest that as these children travel through adolescence and are exposed to more opportunities to engage in risky activities (such as substance use and delinquency) with peers, relationships with these negative peer groups are reinforced and maintained through affiliation with groups engaging in risk. These findings emphasize the importance of identifying early signs of peer risk in young children, and implementing multi-dimensional interventions in order to prevent negative school outcomes and promote school success.

Additionally, results from the third step of the analyses also showed that, when compared to the POS-CON reference group, group membership to the I-RISK or R-START groups was not significantly related to HSDO or graduation, which was inconsistent with hypotheses. These findings were surprising, given the well-documented evidence suggesting the importance of positive peer relationships influencing positive adolescent outcomes (Benner, 2011; Greenman et al., 2009). Moreover, peer trajectories growing less risky over time would have been expected to increase likelihood of graduation and other positive outcomes for youth. Considering the high-risk nature of the youth in the current study, it is possible that students in the full sample experienced a multitude of life-course difficulties and encountered a long history of barriers across multiple contexts. One limitation of this study is that the analyses could not account for the bidirectional influence among and between all the possible factors that could be at play for these high-risk students. Further, there may have been certain risk factors that were undetectable or unmeasurable among this group of students.

It has been consistently documented that the path to HSDO often begins well before a student enters adolescence (e.g., see Hickman et al., 2008) and many models have been proposed, attempting to define the complex pathway to HSDO (e.g., Kronick & Hargis, 1998; Rumberger & Sun Ah Lim, 2008). Results from the present study echo findings from previous researchers suggesting that there is no single pathway leading to HSDO or graduation (Alexander et al., 2001; Rumberger, 2011; Woods, 1995). HSDO appears to be the result of multiple transactional relationships, occurring among complex combinations of intrapersonal and contextual indicators, across multiple domains, that

evolve over time (Bergman et al., 2003; Magnusson, 2003), with each interaction creating barriers or facilitators that increase or decrease the likelihood of success in school.

4.3 Contextual Support and Peer Risk Trajectories

Finally, results from the fourth step of the analyses demonstrated no significant relationship among any of the contextual support variables (family, school, and community) and the NEG-CON trajectory group, which was inconsistent with hypotheses. Given the high-risk nature of the sample, many students across all trajectory groups evidenced low levels of support across all contexts. Additionally, results from ANCOVAs examining group differences between trajectory groups, including potential differences between groups in family, school, and community contexts, showed no significant differences. Thus, it is possible that due to the high-risk nature of the full sample, there was not enough variability to determine if contextual support impacts group membership for this group of students. Additionally, because students who engage in risky peer relationships often evidence risk in other areas of their lives, that bidirectionally influence one another within and between contexts over time (Bergman et al., 2003; Magnusson, 2003), it is possible that the complexity these (NEG-CON) students' peer-related difficulties, may be difficult to comprehensively understand. Future researchers could attempt to isolate specific aspects of family, school, and/or community contexts to better understand which characteristics within these contexts contribute to outcomes for this group of students.

4.4 Limitations

There are important limitations to consider when interpreting the results of the present study. Regarding the lack of findings for Aim 4, an important limitation is that due to the small sample size of the NEG-CON trajectory group ($n=31$), it is possible that the present study did not have enough power to detect significant effects of contextual support for this group if they did exist. Future researchers could examine these contextual predictors for a larger sample of students exhibiting NEG-CON peer characteristics. Additionally, contextual support was examined only at T1. Given the diverse changes that occur during adolescence (as well as the diverse changes that were evidenced in the findings of the present study) it is possible that context may be mediating the relationship between student background and group membership to a peer risk trajectory at a later point in students' trajectories (e.g., T3, T5). It may be fruitful for future researchers to examine the impact of contextual support at later time points to better understand how context influences peer risk trajectories.

Another important limitation to consider, is that data from the present study was obtained from a larger randomized controlled trial that examined the effects of interventions designed to prevent HSDO. Although we controlled for the potential confounding effects of being in the intervention group in the regression models of the current study, it is possible that students who received the interventions in the larger study may have differed in peer risk factors, compared to those in the control group.

Additionally, the current study defined HSDO as “any student leaving school prior to graduation, without receiving a diploma,” which is another limitation of the

study. We were not able to track trajectories of students who may have changed schools prior to the conclusion of the study. Thus, it is possible that students who did graduate after changing schools, could have been incorrectly counted in the HSDO group. Had we been able to track progress of students who transferred schools during the course of the study, findings may have differed.

Participants in this study differed in age and grade level at T1. As youth varied in age from 13 to 18 years at T1, there may have been developmental differences among participants that could have impacted the results. Since many participants in the sample also varied in grade level, entering high school at different times, contextual life experiences may have differed greatly among students. Thus, cohort effects may have also influenced the results.

The sample of the present study also had a high number of missing cases at T3 and especially T5, which is another limitation of this study. To handle missing data, cases were imputed in MPlus using Maximum Likelihood Estimators, which operates under the assumption that data are missing at random. Given the high level of mobility in similar populations at-risk for HSDO (Rumburger, 2011), high levels of missing data were not unexpected; however, it is likely that some of the data in this sample were missing for non-random reasons, which may have impacted the results.

Although this study advances the HSDO literature by using growth modeling techniques to identify multiple unobserved peer-risk subpopulations, describe longitudinal change within unobserved groups, and examine differences in change, limitations of using exploratory techniques, certain limitations associated with any

exploratory method, including growth modeling, should be considered. An important limitation of growth modeling techniques is that researcher's own beliefs could bias the results, limiting objectivity, compared to other non-exploratory methods (Ram & Grimm, 2009). Additionally, as with many exploratory techniques, the results obtained are limited by the specific bounds entered into the model during model specification, and it is not possible to know whether the groups and trajectories generated in the data represent true processes within this sample. The present study utilized ANCOVA to examine the possibility of distinctions between groups as one method to assess validity; however, no significant group differences were identified. Future researchers should use further methods to examine the reliability and validity of these groups (e.g., replication of findings with similar populations of students).

Since no studies currently exist that have examined the specific research questions examined in the present study, these results may provide useful information for future researchers who wish to study similar populations. However, because the sample in the current study included mostly Caucasian males, results may not generalize to other populations. Findings from the current study should be replicated in more representative samples that are stratified among important demographic characteristics such as age, gender, race, socioeconomic status, school quality, and geographic location. These limitations suggest further investigation of peer risk trajectory patterns and their relationship to school outcomes, as well as contextual support factors that may mitigate risk in order to form stronger interpretation of these results.

4.5 Implications for Research

Results from the present study call for using pattern-centered approaches to further investigate at-risk youth's intraindividual differences in peer risk trajectory patterns in other samples of students. Additionally, examination of unique trajectory patterns in other contexts (family, school, community), and assessing these patterns earlier in life, may yield fruitful information for this population of students.

Given findings documenting a predictive relationship between group membership to the NEG-CON trajectory pattern and HSDO, future researchers could investigate which unique characteristics are the driving forces leading to HSDO for this distinct group of 31 students. Given the degree of high peer conflict reported by youth in the NEG-CON trajectory group, compared to youth in other trajectories, it appears that peer conflict may be a factor that sets individuals in this group apart from those in other groups. It may be fruitful for future researchers to examine group differences in specific types of conflict, as well as other risk behaviors (e.g., sexual behaviors, alcohol and drug use, behaviors that contribute to unintentional injuries and violence) to better understand what distinguishes youth in the NEG-CON group from students in other groups. Further, gaining a better understanding of how risk behaviors differ between groups may improve understanding of how negative peer trajectories impact school outcomes, allow for identification of unique characteristics that may signal early risk, and increase understanding of which characteristics may off-set negative trajectories for these students.

Students in the non-continuous trajectory groups (I-RISK and R-START) are defined by their experience of a shift in trajectory from T3 to T5 (from positive to negative peer risk or negative to positive peer risk). It is possible that these shifts could contribute to a change in the course of development for these students, leading to unexpected positive (or negative) school outcomes. Researchers could identify characteristics that signify the occurrence of this pivotal time for students in the I-RISK and R-START trajectories, in order to determine the most effective times to intervene in order to increase changes of positive outcomes for these youth. Identifying characteristics that may signal opportune times for intervention, could help to improve the effectiveness of intervention and may increase the likelihood of positive outcomes for these students. Given the relatively high rate of high school graduation of students in the R-START group (compared to NEG-CON and I-RISK groups) and their shift in high to low levels of peer risk (from T3 to T5), it may be beneficial to examine when this shift in trajectory occurs in order to identify critical times to intervene. Given the high-risk nature of the sample, future researchers could also examine the mediating effect of peer group on the relationship of risk background and school outcomes (HSDO or graduation) to better understand how peer group influences this shift from peer risk to peer success. Further examination of these characteristics may improve our understanding of protective factors and resiliency for these students, leading to the development of interventions for students experiencing difficulties with peer relationships.

Additionally, researchers could attempt to isolate characteristics within the family, school, and community contexts to better understand which conditions are best for influencing peer risk and success. Understanding the role of contextual support on

diverse peer risk trajectory groups may yield targeted interventions for youth experiencing different subtypes of peer risk to promote school success. Interventions targeting children's contexts (family, school, peers, community) have been effective in improving positive academic and social functioning, and influencing school outcomes (e.g., Nicholson et al., 2009; Sanders 1999; Webster-Stratton et al., 2008). Identifying which aspects of contextual support are most important for influencing each subtype of peer risk trajectory group, may lead to the development of targeted prevention and intervention programs that more effectively reduce risk for this population.

4.6 Implications for Families and Schools

These findings may help families, school personnel, psychologists, and other mental health clinicians understand the importance of identifying risk and intervening as early in life as possible for students showing signs of risky peer relationships. They highlight the importance of designing prevention programs and interventions to help children develop and maintain healthy peer relationships to increase the likelihood of positive school outcomes, including graduation. Improving students' relationships with peers may subsequently improve other areas of adolescents' functioning, as well. Because peer functioning is related to success in multiple contexts across the lifespan, it is crucial for both researchers and practitioners to find ways that help mitigate the relationship between NEG-CON and HSDO in order to improve functioning.

Results from the current study also underscore the importance of early identification of children who may be at risk and early intervention to increase likelihood of school success. Improving early identification of risk and determining which

characteristics may signal a shift in trajectory may be important for increasing the likelihood of peer success. Although support within the family, school, and community context did not significantly influence group membership for youth in the NEG-CON trajectory group, results from intervention studies have shown that intervening in multiple contexts is critical for youth engaging in delinquent peer relationships (e.g., Averdijk et al., 2016). Changes within a student's context, such as at the classroom-level (Split, Leflot, Onghea, & Colpin, 2016) and school-level (Bradshaw, Pas, Goldweber, Rosenberg, & Leaf, 2012), or within the neighborhood/community (Johnson, Rich, & Keene, 2016) may impact students' functioning as well. Results from future studies examining contextual influences on peer risk trajectories may help to reveal specific aspects of youths' environment that may yield fruitful results. Results from intervention studies have shown that positive parenting and parental involvement positively impact academic success (Henderson & Mapp, 2002). These findings highlight the importance of identifying risk and intervening early in life, as well as across multiple contexts of development, to help students develop positive peer relationships to facilitate academic success.

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APPENDIX A

CRITERIA FOR STUDENT ELIGIBILITY AND PARTICIPATION IN THE LARGER STUDY

During the initial recruitment process, which occurred during the 2010-2011 school year (the year prior to data collection), teachers, administrators, and other school personnel were asked to identify up to 20 students at each of the 50 participating schools, using the following inclusion/ participation eligibility criteria to guide referrals:

1. Students must currently be in 8th, 9th, 10th, or 11th grade (during 2010-2011 school year) and must plan to attend one of the participating high schools in the fall of 2011.
2. Students must have social, emotional, or behavioral problems, as indicated by parent reports on a broad band rating scale or student self-report on measures of anxiety and depression.
3. Students must demonstrate impairment at school as indicated by at least one of the following:
 - a. Absences other than illness and/or tardies: Combined total of five or more in any month during the current semester.
 - b. Office Referrals/Behavioral Infractions: Four or more over the course of a single semester.
 - c. In school suspensions (ISS) or out of school suspensions (OSS): Two or more in the current academic year.
 - d. Failing classes: One or more Fs or two or more Ds in any core academic subject, in one of the two most recent grading periods.
4. Students diagnosed with a Pervasive Developmental Disorder (e.g., Autism, Aspergers) or Mental Handicap (e.g., Intellectual Disability) are not eligible to participate.

5. Students' cognitive ability must be in the average range (IQ equal to or greater than 75).
6. Student and at least one parent/guardian must speak English fluently.
7. Students may be receiving special education services or may be in general education.

APPENDIX B

LEVELS OF INTERVENTION FOR THE LARGER STUDY

Universal interventions. All participants in the intervention schools received certain universal interventions, such as the Check and Connect (C&C; Sinclair, Christenson, Evelo, & Hurley, 1998) mentoring intervention and Interpersonal Skills Group (ISG). C&C is a mentoring intervention, designed to prevent HSDO and promote student engagement. It is supported by twenty years of research and has demonstrated effectiveness among students in elementary, middle, and high school levels, in both urban and suburban communities, and among students with and without disabilities (Lehr, Sinclair, & Christenson, 2004; Sinclair et al., 1998; Sinclair & Kaibel, 2002; Thurlow, Christenson, Sinclair, & Evelo, 1997). Through the C&C intervention, students are paired with a school-based mentor, who monitors academic and behavioral school functioning indicators (e.g., absences, missing assignments, behavior referrals) on a weekly basis. Mentors and students meet weekly. During these meetings mentors celebrate student successes, help students to identify areas of improvement for the following week, and help guide students through problem solving strategies when difficulties in school arise. Mentors also consult regularly with students' teachers and parents in order to coordinate supports across settings (Sinclair et al., 1998). All CARS participants also received the interpersonal skills group (ISG) intervention, a weekly skill-building group led by the school counselor or social worker to build social, emotional, and behavioral skills. Both C&C mentors and ISG leaders connected students to additional resources and supports as needed (e.g., school counselor, psychologist, or social worker).

Classroom level interventions. If difficulties were indicated through the C&C monitoring system (e.g., failing grades, skipping classes, missing assignments), mentors and/or CARS staff consulted with the student's teachers to identify potential sources of student difficulties and discuss classroom strategies to help improve student performance. Some examples of strategies used through the CARS project included improving

teacher-student interactions (e.g., increasing teachers' positive to negative comment ratio to five positive comments for every one negative comment), increasing opportunities to respond in class (e.g., incorporating activities such as use of white boards to answer questions or using strategies to remind the teacher to call on all students more frequently), and establishing expectations (e.g., creating and communicating classroom rules to students that are specific, measurable, attainable, realistic, and time-bound).

Individualized interventions. At times individualized interventions were also indicated for students. CARS staff facilitated the implementation of these interventions by working with C&C mentors and teachers to identify areas of improvement and identifying school personnel (e.g., teachers, C&C mentor) to implement the intervention. For instance if a student's C&C mentor determined that a student was failing one of his or her classes and the reason appeared to be that the student was not completing his or her homework assignments consistently, the mentor and/or CARS staff might identify a school staff member to teach the student organization strategies such as use of an agenda to record homework assignments or an organization checklist of items needed to bring home to complete homework. Other examples of individualized interventions include self-monitoring strategies, such as use of a missing assignment tracking sheet (to help reduce number of missing assignments), as well as study skills and test taking strategies.